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PREFACE

(U) This report summarizes the information available on Soviet research on human vulnerability as it relates to incapacitating individuals or small groups. The information contained in this study is a review and evaluation of Soviet research in the field of revolutionary methods of influencing human behavior and is intended as an aid in the development of countermeasures for the protection of US or allied personnel. Due to the nature of the Soviet research in the area of reorientation or incapacitation of human behavior, this report emphasizes the individual as opposed to groups.

(U) It is not within the realm of this report to make an in-depth study of research and utilization of the multitudinous aspects of psychology and psychiatry. It is strongly suggested that these subjects, and the military use thereof, should be established as separate studies. The importance of basic and applied research in these areas should not be overlooked.

(U) The information reported covers the period from 1874-1972 and has been drawn from scientific, medical and military journals, intelligence reports, magazines, news items, books, conferences, and other reports as referenced. The information cut-off date for this report was 31 January 1972.

(U) The author of this study is Captain John D. LaMothe, Medical Intelligence Office, Office of The Surgeon General, Department of the Army, Washington, DC 20314. Constructive criticism, comment and suggested changes are invited from readers. These should be sent to the author through the Defense Intelligence Agency, ATTN: DT-1A, Washington, DC 20301.

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SUMMARY

(U) Controlled offensive behavior as defined within the scope of this report includes Soviet research on human vulnerability as it applies to methods of influencing or altering human behavior. There is an ever increasing amount of information emanating from the USSR (samizdat or underground press) that suggests that certain authoritarian institutions in the USSR are engaged in the practice of "mental reorientation" of numerous individuals who are classed as political dissenters. The "mental reorientation" is being accomplished through various means including confinement, isolation and psychopharmaceutical administration. This treatment of so-called insane individuals is causing alarm among an international cross section of psychiatrists. The literature contains sufficient data on human mental manipulation and, therefore, warrants surveillance by interested parties. It appears that the USSR stresses physical and medical "treatment" of its political detainees under the guise of psychiatric-care rehabilitation.

(U) The Soviet Union is well aware of the benefits and applications of parapsychology research. The term parapsychology denotes a multidisciplinary field consisting of the sciences of bionics, biophysics, psychophysics, psychology, physiology and neuropsychiatry. Many scientists, US and Soviet, feel that parapsychology can be harnessed to create conditions where one can alter or manipulate the minds of others. The major impetus behind the Soviet drive to harness the possible capabilities of telepathic communication, telekinetics, and bionics are said to come from the Soviet military and the KGB. Today, it is reported that the USSR has twenty or more centers for the study of parapsychological phenomena, with an annual budget estimated at 21 million dollars. Parapsychological research in the USSR began in the 1920s and has continued to the present. Based on their "head start" and financial support, it could be concluded that Soviet knowledge in this field is superior to that of the US.

(U) Methods for controlling behavior of the human being are numerous. Not all of the possibilities were included in this report, but an attempt was made to elaborate on those areas where there is intensive research by the USSR. The use of sound, light and color, or odors have been determined to be possible means for Soviet exploitation in order to alter human behavior. In the area of color and lights, usually in a flickering mode, there have been reports of actual "trials" by the Soviets (Air Force and Navy) on US or allied personnel. The Soviets have shown an in-depth knowledge in the effects of sound and light on biological systems. It appears that with their

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knowledge, it would be a rather simple procedure to make the transformation (from scientific research to the applications phase). The area of pheromone research has interested the Soviets; however, their data is sketchy and it is conceivable that they are not yet aware of the tremendous potentials that these substances provide for causing human behavioral changes. It is also a possibility that the USSR has realized the military benefits and are not publishing or conversing about their research and development efforts concerning pheromone synthesis and uses.

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PART I

INTRODUCTION TO HUMAN BEHAVIOR MANIPULATION

SECTION I - BACKGROUND

1. (U) Methods for manipulating or influencing the human mind exist and are being thoroughly researched by members of the Soviet scientific community. For background and introductory information it would be best if some of these methods were briefly mentioned. Techniques studied by the Soviets include biochemicals, sound, light, color, odors, sensory deprivation, sleep, electronic and magnetic fields, hypnosis, autosuggestion, and paranormal phenomena (psychokinesis, extrasensory perception, astral projection, dream state, clairvoyance, and precognition). Paranormal phenomena have caused great excitement in recent years in the Soviet Union; so much so, that it has been reported (1) that the Soviets had 20 or more centers in 1967 for the study of this area. It was also reported that the annual budget for 1967 for paranormal research was approximately $20 million.

2. (U) The purpose of mind altering techniques is to create one or more of several different possible states in the conscious or unconscious area of the brain. The ultimate goal of controlled offensive behavior might well be the total submission of one's will to some outside force. It is more realistic to assume that lesser degrees of mental aberration would be the purpose of Soviet research in this field. Some areas of human mind manipulation that apply to this report are morale lowering, confusion, anxiety, loss of confidence, loss of self reliance, fatigue, persuasion, disruption of social cohesion, or complete incapacitation. Since the desired end product of this type of research is some change in the human mind, only the non-lethal aspects are discussed in this report. It should be remembered, however, that some techniques have lethal thresholds.

3. (U) The purpose of this study is to portray the Soviet research in mind manipulation and its possible use on US or allied individuals (e.g. PW's) or troops. Controlled offensive behavior, however, has other connotations. Certain methods of altering mental or physical states of man may have application on one's own individuals. The apport technique and astral projection are examples which will be discussed in this report. These two methods allow the enemy to impart certain behavioral characteristics on its own people to the detriment of US or allied personnel or missions.

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SECTION II - CURRENT EVENTS

PART A - Events in Northern Ireland

1. (U) The following discussion is based on 1971 and 1972 literature dealing with the manipulation of human behavior. The events that have been reported to have occurred are not Soviet originated but provide an excellent example of the type of efforts that this report is expressing.

2. (U) Recently there has appeared in the press some discussion elaborating on the techniques and procedures for detaining, treating, and interrogating prisoners in Northern Ireland (2,3). According to the report, once the detainees are in prison, they come under three types of regime which create in men a state of great confusion, suggestibility, and distress. The first regime contained various methods to produce sensory isolation. The men were made to stand still against a wall with their hands in the air for four to six hours at a time. The total length was 43 1/2 hours. Hoods were placed over the men's heads to further abolish visual input. Sensory input was further decreased by having loud noise generators turned on in order to mask meaningful sounds. The detainees were, therefore, isolated from their sensory world.

3. (U) The second sensory regime has the effect of increasing confusion and disorientation. Some men were rushed out, hooded and doubled up, past barking dogs, loaded into a helicopter, doors closed, engine revved up, then unloaded, then reloaded, with the procedure repeated three times. In another incident, detainees without shoes were made to move quickly over rough ground by military police.

4. (U) The third type of treatment has the effect of increasing stress and anxiety and reducing resistance to the disorienting effect on the two types described above. It appears that dietary intake was restricted to bread and water at six hour intervals. Maximum weight loss was achieved it appears. One detainee lost eight pounds in seven days. To accompany the diet restrictions, no sleep was allowed the first two or three days. Forty-eight hours sleep deprivation, in certain individuals, has been known to precipitate psychotic-like states.

5. (U) Psychological torture and physical abuse has been used on Catholic detainees in Northern Ireland. High-frequency sound waves (range not given in report) and sensory deprivation - research methods that have been outlawed for use on humans by the American

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Psychological Association - were being used to undermine the dignity and destroy the effectiveness of the Catholic minority of Northern Ireland. The case of one 40-year old released prisoner has been reported. Upon release, the man's mental and physical condition suggested senility - a condition inconsistent with his health at the time of his internment. The man walks like he is 65, whimpers in the dark and has an attention span so short he cannot carry on a conversation.

6. (U) The Northern Ireland procedure can be expected to greatly increase the pliability of detainees under interrogation since sensory deprivation increases suggestability and lowers intellectual competence. Stress-isolation techniques can reach the extent of eliciting false confessions where both prisoner and interrogator are convinced the statements rendered are true. It is hoped that the above examples impart to the reader a feeling for the type of mind manipulating procedures that will be discussed later in this report.

7. (U) Since it appears that the research behind sensory deprivation has been put to current use on humans, the interested reader might peruse Biderman and Zimmer's 1961 publication entitled "The Manipulation of Human Behavior" (4). The book represents a critical examination of some of the conjectures about the application of scientific knowledge to manipulation of human behavior. The problem is explored within a particular frame of reference: the interrogation of an unwilling subject. Attention has been focused on interrogation because of the central position this topic has had in public discussions of prisoner of war (PW) behavior.

PART B - Events in the Soviet Union

1. (U) The use of psychiatric detention to silence political dissenters appears to be a method being utilized by the Soviet Union. There is extensive documention from "samizdat" (self-published) sources in the Soviet Union, notably "A Question of Madness" by Soviet geneticist Zhores Medvedev, excerpts from which were published in the Sunday New York Times Magazine of November 7, 1971 (5). British Sovietologist Peter Reddaway asserts that the number of such political detainees in the USSR has grown sharply in the last two years, perhaps to several hundred (6). Peter Reddaway has published several articles that give brief accounts of several political detainees as well as publishing letters received from the Soviet underground (7,8,9).

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2. (U) On the surface, the fact that the Soviet Union has been subjecting political dissenters to psychiatric institutions may not appear relevant to this report. However, as one probes into this area, he discovers that the medical and physical treatment of these prisoners borders on the subject of controlled offensive behavior. Since the techniques are reportedly being applied to Soviet citizens, it is simple enough, as the researchers gain knowledge and expertise in this area, to assume that alien personnel could someday be subjected to it as well.

3. (U) From the many reports, some coming from the Soviet Union underground press, the article that best relates some of the medical and physical treatment to political detainees is discussed below (10). The article was written about Vladimir Bukovsky who is frequently quoted in the feature story. Bukovsky has spent six of his 27 years in Soviet prisons, asylums and labor camps. (On January 5, 1972, Bukovsky was sentenced to a 12-year confinement to include prison, hard labor camp, and internal exile.) In 1962, Bukovsky organized an illegal exhibition of paintings by abstract artists not approved by state censors. In May 1963, Bukovsky was arrested by the KGB. He was declared insane by the Serbsky Psychiatric Institute. That December, he was transferred to a prison asylum in Leningrad (name not mentioned) where he spent, in his own words, "15 months of hell." "There were about 1,000 men in the asylum, political prisoners and insane murderers," says Bukovsky. "The sick raved, the healthy suffered." Doctors were technically in charge of the inmates, but the real masters were brutal turnkeys and prisoner trustees. "Only the crafty survived, you had to be nice to the guards.... you had to bribe them. Otherwise, they can beat you until you are nearly dead and tell the doctors you misbehaved. Or they could recommend medical punishment."

4. (U) The worst, according to Bukovsky, was medical punishment. The three methods of medical punishment known to Bukovsky are described as follows:

a. On the recommendation of a trustee or turnkey, doctors would inject a drug (not mentioned) that produced severe stomach cramps, fever, intense pain, and a temperature of 104. The sickness lasted two or three days and left the inmate very weak.

b. Another drug reserved for serious misbehavior induced sleep and dulled the brain. Inmates were punished with ten days of daily injections. They woke up as human vegetables. Some regained their senses after two months, others did not.

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c. The third punishment was the canvas bandage. An inmate would be tightly swathed in wet canvas from neck to toes while others in his ward were forced to watch. "The canvas shrinks as it dries. It is not a pretty sight. They usually only do it for two or three hours. A nurse is always in attendance, and the bandages are loosened when the pulse grows weak."

5. (U) A thousand-word telegram by Andrei D. Sakhaiov to Colonel Nikolai A. Shchelokov, Minister of the Interior, relates further information on the use of drugs to alter mental behavior (11). Sakhaiov, a physicist and civil-rights champion, charged that a violation of human rights and medical ethics is occurring in the Soviet Union. The contention is that drugs are being administered forcibly to inmates in an effort to have them change their political beliefs. In addition, some prisoners are threatened with the possible use of electrical-shock "therapy." According to Sakhaiov, medicine, one of the most humane of the professions, is thus being turned into a servile handmaiden of the regimes correction agencies. It is further reported that with the help of medicine, an attempt is being made to make people literally lose their minds by chemical and physical means if they refuse to adapt their mind to the standards of the regime.

6. (U) One of the few references that mention a drug by name is a London Times feature by Richard Preston (12). In several cases, Soviet authorities forced political prisoners to submit to the use of mind-bending drugs, specifically aminazine and haloperidol. Aminazine is the Soviet brand of a phenothiazine derivative known as chlorpromazine. Haloperidol is a butyrophenone. Both drugs are in the tranquilizer class of therapeutic agents. An excellent discussion on both of these drugs has been prepared by Goodman and Gilman (13).

7. (U) Information on the plight of political prisoners in mental wards and other examples of internal Soviet repression is contained in Issue 18 of "A Chronicle of Current Events." The chronicle has just passed its third anniversary despite the increasing efforts of the KGB to shut down this underground publication. The last issue discusses the case of Vasily I. Chernyshov who was arrested in March of 1970. The chronicle quotes Chernyshov.... "I am terribly afraid of torture. But there is an even worse torture - meddling with my brain with chemical substances. I have now been informed of the decision that I shall be given treatment. Farewell!" Chernyshov's compulsory "treatment" was prescribed after only a five minute interview with the authorities. The concluding statement from the panel of doctors was, "The main thing for us is that you shouldn't think at all."

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8. (U) A document that contains several case histories of political detainees has been prepared by Abraham Brumberg (14). The article summarizes the procedure that is used in the Soviet Union from arrest to confession. According to the report, the KGB performs the search, arrest, and initial investigation. The medical "experts" cooperate in furnishing bogus diagnoses and the court confirms the findings of the doctors. The victim is then sent off to a prison asylum to languish until "cured" (which in most cases consists of the patient's confession that he is indeed guilty of some form of mental aberration).

9. (U) The legal procedures involved in detaining an "undesirable" have been drastically reduced by the "1961 Directives" (15). V.N. Chalidze (16), in an underground document, explains how the "1961 Directives" allow for the immediate detention of a sane individual who is not a criminal in the legal sense. Chalidze sums up his argument by noting that the viciousness of the present-day practice, not based on the law, of psychiatric preventive measures is due to the absence of any public means of defense for the patient. The "1961 Directives" are included in this report in Appendix IV.

10. (U) The office that prepared this study has copies of various reports from the Soviet Union that deal with some of the more celebrated political detainees. There are three reports available that illustrate the forensic-psychiatric examinations of I. A. Yakhimovich. Two of these documents list the names of the psychiatric teams that carried out the examination (17-19). By reading these reports, one can trace the fate of Yakhimovich up to early 1970. No further reports were available so the ultimate fate of the individual is unknown.

11. (U) A report is available on A. Volpin (20) that was apparently prepared by the individual while in detention. There have been several cases where these documents have been "smuggled" out of the asylum. An outpatient report on V.E. Borosov is available (21). This report condemns Borosov to compulsory psychiatric treatment. Reports are available on the plight of N.E. Gorbanevskaya (22,23) as well as several letters that she wrote while interned (24). An appeal for human rights written by V. Fainberg while he was incarcerated is on file (25) as well as documents relating to the sanity proceedings for General P.G. Grigorenko (26-28).

12. (U) The possible use of drugs by Soviet psychiatrists in order to manipulate behavior can be emphasized by an account from Vladimir Gershuni, a Soviet idealist. The event that follows occurred at the Oryol Hospital which is some 170 miles

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southwest of Moscow. Mr. Gershuni gives a description of the conditions in which mental patients (both genuine and political) are held. "Eight people to a 16 or 17 meter cell. . . . (Comment: This seems large enough for eight people if figure is correct.) There is no room to move. One is allowed to go along the corridor, but only if it's absolutely necessary - to the toilet, or to get some food from the nurse. . . . The toilet is a cesspit: four holes in the ground and two taps for 54 people. . . . From 7 to 8:30 in the evening we're allowed to use the dining room for writing letters, or to play dominoes and chess. The bedlam is indescribable." Mr. Gershuni talks about the use of drugs, one of which is aminazine, a powerful substance, administered orally or by intramuscular injections, which causes depressive shock reactions and frequently malignant tumors. Sometimes drugs are given as a form of punishment. "Any phrase spoken incautiously to a doctor or nurse can serve as a pretext for a series of aminazine injections. Sometimes these injections are prescribed without any pretext, simply because of some doctor's whim . . . without any medical examination. . . . This medicine makes me feel more horrible than anything I've ever experienced before; you no sooner lie down than you want to get up, you no sooner take a step than you're longing to sit down, and if you sit down, you want to walk again - and there's nowhere to walk." Mr. Gershuni finishes his account by describing the fate of a young man, once brilliantly "alive and alert," who as a result of repeated doses of aminazine, "and God only knows what else," had been reduced to a vegetable: "his head on one side, his speech languid and indistinct, his eyes glazed." "He was thus," concludes Mr. Gershuni, "cancelled out for five whole months. Hail to Soviet 'special psychiatry'! I kiss you all."

13. (U) To belabor this subject of political detention is not the intention of this section. However, it is believed to be of sufficient importance that this much material had to be presented. It is difficult to judge the overall validity of much of the referenced material because of its source (primarily samizdat and letters), but if true, it bears watching and possible investigation for future developments. Portions of this material contain sufficient data on human mental manipulation and therefore warrants surveilance by interested agencies. From the information available at this time, it appears that the Soviet Union stresses physical and medical "treatment" of its political detainees under the guise of psychiatric-care rehabilitation. No data is available on the use of sound, lights, or hypnosis as methods of obtaining confessions or reorientating the beliefs of these prisoners. For a listing of personnel and institutes involved in political-psychiatric care, see Appendix I. Many personalities involved

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in the maltreatment of detainees are not listed but can be found in the references listed. An attempt was made to list only the top professional personnel.

PART C - Soviet Response to Events in the USSR

1. (U) The Soviet government, quite naturally, has denied the charges made in the USSR and abroad that mentally stable persons were being detained in psychiatric hospitals because of dissident activities. The Soviet authorities had said little about the accusations until an article written by S.P. Pisarev was obtained by Western sources from the Soviet underground (30). Pisarev, 69, member of the Soviet Communist party since 1918 and minor party official, in 1970 directed a letter to the Soviet Academy of Medical Sciences protesting the Soviet police practice of sending political prisoners to "psychiatric institutions" such as the infamous Serbsky Institute in Moscow.

2. (U) Disputing the type of charge mentioned by Pisarev, Soviet authorities contended persons remanded by a legal psychiatric commission to special mental institutions were those "who committed socially dangerous acts while not responsible for their actions or became ill during a pretrial investigation, during actual court proceedings or after the passing of sentence." According to the Soviet government, such cases are reviewed every six months and committed persons are released if sufficient improvement is found in their mental health (31).

3. (U) A.V. Snezhnevskiy (32), USSR Academy of Medical Sciences academician and director of the USSR Academy of Medical Sciences Psychiatric Institute says:

> "Yes, I, too, have read these absurd reports that in the USSR healthy people are put into psychiatric hospitals. Like all my colleagues, I cannot express my feelings of profound indignation at this wild fantasy. Soviet psychiatrists - a detachment of Soviet medical workers consisting of many thousands - do not, of course, need to be defended from insulting attacks of this sort. In our country and abroad fame and deserved authority are enjoyed by such psychiatrists as A.D. Zurabasvili, V.M. Morozov . . . ." etc. (Snezhnevskiy mentions eight other psychiatrists).

Snezhnevskiy continues his argument by listing the members of a US mission that toured Soviet psychiatric facilities. The mission says in its conclusion . . . . "It appears that the Soviets are leading."

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The US guests stressed the high degree of effectiveness of the Soviet psychiatric first aid centers, and the better quality of their staffs compared with US centers. The US delegation did visit the Serbsky Institute. As for compulsory treatment, the mission stated . . . . "It is possible that people who need treatment should be compulsorily hospitalized for their own good."

4. (U) Snezhnevskiy, in another document (33), said that when mentioning "brainwashing" many absurd allegations have been made, such as the talk of injecting a substance which paralyzes a person's will. Snezhnevskiy contends that "brainwashing," from a scientific point of view, is absurd. He further believes that the people dedicated to this sort of propaganda have very few scruples and direct the propaganda to laymen who know nothing about medicine. Interviews with Snezhnevskiy and Lebeden, chief of psychiatry at the Pavlov hospital in Leningrad, were obtained just prior to the Fifth World Psychiatric Congress in Mexico City which was held in early December 1971 (34).

5. (U) The literature from Soviet authorities denying the mal-treatment of detainees or other charges does not mention any of the more celebrated prisoners with the exception of Zhores Medvedev who was released after a very short stay. One can draw some obvious conjectures based on the avoidance of such personalities as Gershuni, Grigorenko, Bukovsky, Fainberg, and Borisov in the Soviet statements. The issue of inhumane treatment is usually responded to with the use of platitudes and counter-propaganda. If the Soviets have nothing to conceal, then it would seem that one could expect more scientific and concrete responses as to the actual situation in political detention and behavior manipulation with drugs.

SECTION III - SOVIET PSYCHOLOGY AND PSYCHIATRY

PART A - A General Review

1. (U) The past fifteen years have witnessed a definite acceleration of growth in Soviet psychology (35). It has been observed by some American psychologists that an upward trend in the quality and quantity of Soviet published research began around the middle of the 1950's. Research designs improved, greater experimental controls were employed, and the level of sophistication in laboratory techniques started to rise perceptibly. Many new people are entering into the area of psychology and the increase has been (1966) as much as a factor of 2,3, or 4 (36). According to this source (36), Soviet

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psychology is in a growth stage which appears to have sprung up coincident to the man-in-space program. Contrary to the reference above (36), this source (36) believes that despite the growth and acceptance by the Soviet scientific community, the Soviets are merely duplicating or extending to some degree the research that is already known. In the opinion of this source, there is definitely a tie-in between the Soviet engineers, psychiatrists and psychologists. It must be remembered that the Soviets are presently in a growth stage and, therefore, are merely making their investments at this time. According to this source, once they have reached the level off period then this coordination of the disciplines will pay off handsomely in returns to the Soviet psychological society. The source believes that in the area of human engineering the Soviets are moving very rapidly and at least in many respects are close to US levels. In behavior studies, the Soviets are stagnant. They lean too heavily on the conditional response approach of Pavlov. In the neurosensory areas, source believes that the Soviets are considerably behind the US and accept the US as the leader in this field.

2. (U) According to one report, there is apparently classified psychological research work going on in the area of cybernetics. One area that surveillance would appear fruitful is Soviet research in the area of artificial intelligence. This report contains a substantial number of institutes and personalities which is reflected in Appendix I (37).

3. (U) It is concluded that, in spite of their ideological resistance to theoretical psychology, Soviet behavior scientists share a distinguished experimental tradition and possess the ability to incorporate and combine the principles of biocybernetics, physiology, learning, memory, and transfer under a common group of laws (38).

4. (U) The following brief discussion of Soviet psychiatry is based primarily upon a report by Persic (39). The report contains a brief history of psychiatry in the Soviet Union followed by a section that relates to the scientific and investigative work in psychiatry. Also included is a section on the organization of psychiatric care including statistics on the number of patients, beds, and medical personnel in the Soviet Union.

5. (U) According to Persic there are 94 medical institutes and a greater number of medical research institutes. The following research institutes in psychiatry exist in Moscow: the Psychiatric Institute at the Academy of Science; the Psychiatric Institute at the Ministry of Health for the Russian Federation, and the Institute for Forensic Psychiatry at the Institute of the Ministry of Health

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of the USSR (Serbsky Institute). The research institutes are either of a general type or of a specialized type which study certain mental diseases e.g. schizophrenia, epilepsy, or alcoholism. The psychiatric research institutes have similar organizational schemes: clinical departments, laboratories, and methodics departments. The Psychiatric Institute of the Academy of Sciences in Moscow is the post-graduate school for psychiatrists. At the Institute for Forensic Psychiatry in Moscow (Serbsky) are clinics for schizophrenia, psychoorganic disorders, and alcoholism. (Naturally there is no discussion in this report of some of the more infamous areas of the Serbsky Institute.)

6. (U) The task of psychiatric institutes is to deal with the educational matters of students, and physicians specializing in psychiatry. This work is conducted in the form of seminars and in the form of continuous education. The psychiatric research institutes are connected with psychiatric hospitals, departments and dispensaries in advancing psychiatric work and the organizing of psychiatric service. Great attention is devoted to health education in the USSR. A great network of institutions devoted to health instruction exist. They are affiliated with many groups which dispense health advice. Included in the general health education is also education concerning mental health. There are 360 health institutes in the USSR which are devoted to teaching health. The Central Institute for Health Education in Moscow is engaged in research in the field of health education, education of experts, training in the methodology of health education and organizing health training. This Institute employs a method of providing health education for schools, students of medicine, for workers in industry and hospitals. There is also cooperation with physicians concerning public health and seminars are held where practical matters are discussed. There is also a functional connection with health agencies so that officials of these agencies cooperate with the Institute and attend seminars. These health agencies also receive support from the Institute in the form of trained help and literature which the Institute publishes through its own printing outlets. Table I depicts the instructional requirements for psychiatric specialization. These figures were prepared by Persic. Table II illustrates statistics on the number of neurologists and psychiatrists in the USSR in 1962 (Persic) and 1967. The 1967 data was compiled by Fry (40). Fry, in his report, combined neurologists and psychiatrists into one figure.

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TABLE I

Plan of Instruction and Stages in Psychiatric Specialization-USSR

Subject	Hours of theoretical training	Hours of practical training
Psychopathology	16	60
Clinical psychiatry		
Schizophrenia	16	
Manic depressive psychosis	6	
Infectional psychosis	16	
Toxic psychosis	6	
Epilepsy	6	
Noninfectional symptomatic psychosis	8	
Brain trauma	4	400
Arteriosclerotic psychosis	6	
Brain tumors	2	
Presenile psychosis	4	
Senile psychosis	4	
Oligophrenia	2	
Psychopathy	4	
Psychogenic reaction	4	
Organization of Psychiatric Service	4	
Total	108	460

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TABLE II

Comparison of the Number of Psychiatric Specialists in USSR-1962 and 1967

	1962	1967
Population	220,000,000	230,000,000
Physicians	400,000	480,000
Psychiatrists	6,140	Combined Psychiatrists and Neurologists total: 24,000
Neurologists	9,850	
One physician per	520 people	480 people
One psychiatrist per	35,835 people	Combined Psychiatrists and Neurologists total: 20,000 people
One neurologist per	22,335 people	

7. (U) The figures in Table II, if valid, represent a substantial growth in the number of specialists in mental health care. The number and quality of both psychology and psychiatry research reports is increasing, especially in the behavioral fields. There appears to be an ever increasing link between the psychology and psychiatry fields with the pharmacology, human engineering, bioelectronics, physics, and parapsychology disciplines. Some of the multidiscipline aspects of Soviet research will become evident later in this study as it relates to the subject of this report. The above information on psychology and psychiatry was intended to be a review because it is believed that there is a definite relationship between the two disciplines and mental manipulation. It is not within the scope of this report to delve into basic psychological research and discuss its military implications.

PART B - Soviet Military Psychology

1. (U) The purpose of this report is to make determinations and report findings on methods of controlling human behavior. One aspect of this subject is the possible use of certain novel techniques to disrupt or confuse combat troops. Based on Soviet literature dealing with military psychology, it appears that the Soviet military authorities might well suspect their potential enemies as already being able to do this. The available Soviet literature on military psychology emphasizes the protection of their troops against such possible attempts e.g. demoralization and confusion.

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2. (U) In 1967, a book entitled "Military Psychology" was published in the Soviet Union. The authors, Colonel Dyachenko and Major Fedenko, are Candidates of Pedagogical Sciences (41). This book is primarily intended for commanders and military doctors. The book deals with the various aspects of the personality of the soldier including his cognitive, emotional, and volitional processes, his fighting skill, and his psychological readiness for battle. All of the psychic phenomena are based on the service, training, and fighting activity of enlisted and commissioned personnel. One of the more interesting areas is found in Chapter 8 which is entitled "Will Power." The chapter contains information on will power as a psychic process. The chapter continues by discussing the qualities of will power necessary to a soldier as well as methods of training will power. The discussion on will power appears to be a very important topic because if one's will power is sufficiently developed, the use of techniques to demoralize or confuse could well be nullified. Part one of the book describes the general problems of military psychology, followed by a discussion on psychic processes of the soldier and concluding with the psychological analysis of the activity of Soviet soldiers.

3. (U) The group of people most susceptible to offensive behavior manipulation appear to be rear-zone troops and small patrol groups. The Soviets again seem to recognize the fallibility of such groups. Lieutenant General Tyurnev (42) reports that the moral-psychological training of administrative support troops in operations under conditions of modern war is a quite urgent and complicated problem. The report suggests training and propaganda methods to increase the morale-psychological condition of rear-zone troops. The training, to include evening seminars, propaganda sessions, political indoctrination and field exercises is suggested in Tyurnev's report. The word moral and morale seem to be interchanged frequently in the report. It seems to be a problem in translation, because the author's thoughts are still meaningful.

4. (U) Two further reports from the Soviets have appeared recently. One report (43) discusses the role of medicine and military medical personnel in the psychoprophylaxis in morale-psychological preparation. A 1970 report by Stolyarenko (44) reinforces the thoughts of Tyurnev. From the above discussion and a thorough perusal of the documents referenced in this section, it could be stated: if the Soviets practice what they preach, the psychological training of Soviet troops is as good as or better than US soldiers. This does not include the special training afforded to US pilots on anti-interrogation methods.

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SECTION IV - PSYCHOLOGICAL PHENOMENA/PSYCHOLOGICAL WEAPONS

(U) One of the purposes of this report is to evaluate research in the field of influencing human behavior in order that the US may be in a position to develop certain countermeasures. Therefore, before beginning specific sections in this report on Soviet research, it is desirable to review some of the more feasible areas of exploitation in the development of a technique that might alter human behavior. Some of these characteristics will be studied in depth in later sections of this study.

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PART A - Temperature

1. (U) An increase in body temperature decreases the body water level and creates a salt-water imbalance. With a large intake of water, but little replacement of sodium chloride, painful spasms of the skeletal and abdominal muscles may develop as may also faintness, weakness, nausea, and vomiting. With an internal temperature above 41 degrees C or below 31 degrees C, brain function is usually impaired. Irreversible damage to the skin occurs at about 44-45 degrees C (46,47).

2. (U) The sensitivity and tolerance for temperature changes is different for certain races. Negroes have a greater tolerance for humid heat than Caucasians, and conversely, Negroes are more susceptible to injury from cold stress than Caucasians.

3. (U) It is believed that the use of temperature manipulation as a technique to influence human behavior is practical. In order to be effective it would seem necessary to apply this technique to individuals or small groups that are already under one's influence such as prisoners of war. The application of unnatural temperature in field situations appear to be most difficult. Further, there appears to be very little applicable research in the USSR in this area other than some isolated work in the areospace field. It may be concluded that temperature fluctuations could be used for altering human behavior, but would probably not be as useful as other available methods.

PART B - Atmospheric Conditions

1. (U) There has been some work reported on the physiological or psychological effects of atmospheric or geophysical parameters (48-51). The works referenced here are free world but there is little doubt that the Soviet Union has investigated similar effects especially in relation to their space program. The utilization of any of the techniques to alter human behavior by changing atmospheric conditions seems remote for field application. These techniques, like temperature effects, are more suitable for controlled groups or individuals.

2. (U) An increase of 0.2 percent carbon dioxide doubles the volume of air breathed. Breathing becomes deeper, more rapid, and eventually violent. Depletion of oxygen or the increase of carbon dioxide decreases auditory sensitivity as well as visual sensitivity. Ten percent of oxygen for 15 to 30 minutes sometimes

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results in a hearing deficit for several hours. With severe or prolonged anoxia there may be nausea, vomiting, extreme weakness, and eventually convulsions and cardiac failure (52). Perhaps the applicable symptoms of anoxia to this report are the homeostatic inbalances in the brain: loss of ability to carry on complex activities, restlessness, loquacity, delirium, confusion, and unconsciousness.

3. (U) Intermittent exposures to negatively ionized air produces a sedating effect on humans. There are some researchers who believe that positively ionized air causes irritation and anxiety which is applicable to altering behavior.

PART C - Olfactory Phenomena

1. (U) Seven primary odors have been identified; they are camphoraceous, musky, floral, minty, pungent, putrid, and ethereal (53). From the seven primary odors, every known odor can be made by mixing them in certain proportions.

2. (U) Man expresses pleasure or displeasure to various odors. If the smell is foul or irritating enough, man will attempt to avoid it. If escape is hindered or if odors are used with surprise they may elicit certain behavioral changes in the individual. Odors are suitable for use in controlled situations and in the field. For these reasons odors will be discussed more fully later in this report.

PART D - Light

1. (U) Although it is customary to specify the wavelength range of visible light as lying between 400 and 750 millimicrons (mμ), nevertheless, with sufficient energy, the eye can be stimulated up to 1050 mμ. Also, the fovea (phototopic vision) can be stimulated down to about 320 mμ. It is thought that 1150-1200 mu marks the limit at which radiant energy would cease to be seen and would be readily felt as heat (54).

2. (U) Yellow light has maximum effect on the retina and is most effective in eliciting photophobia. Non-rhythmic bright lights can interrupt or prevent sleep. It has been claimed that if sensory stimulation is sufficient, sleep can be prevented even if fatigue is carried to the point of death (52). The physiological

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and psychological effects of flashing lights (stable) and photic-flicker appear to have raised interests in the Soviet Union. Since lights can be utilized in the field or in controlled situations and do cause certain behavioral changes in man, this subject will be discussed in detail later in this report.

PART E - Sound

1. (U) Sound, from one source or another, has been used to elicit behavioral changes in man in every war ever recorded. It may be a simple bugle call or battle cry or a mechanical siren device; but whatever is used there is normally a psychological response by the receiver. Regardless of the absolute level, sounds of enemy weapons with which one is unfamiliar is frightening provided the sounds are associated with a feared weapon or the unknown.

2. (U) Auditory effects have been and still are researched. Nerve deafness can certainly result from prolonged exposure to loud sounds. For the purpose of this study it is believed that the nonauditory effects are just as important when discussing behavioral alterations. For example, exposure to a siren-generated sound of 20 kilohertz at 1 watt per square centimeter kills a variety of insect life in three to four minutes and larger animals (mice) in about one minute. Human operators, with earplugs, experience "cool sizzling sensations" in the mouth and an unpleasant tingling in the nasal passages when near the siren.

3. (U) Sound can be used on controlled groups or in the field. Sound can produce behavioral changes and the effects of sound on humans is being investigated in the Soviet Union. For these reasons, a more detailed discussion can be found later in this report.

PART F - Electromagnetic Energy

1. (U) Super-high frequency electromagnetic oscillations (SHF) may have potential use as a technique for altering human behavior. Soviet Union and other foreign literature sources contain over 500 studies devoted to the biological effect of SHF. Lethal and non-lethal aspects have been shown to exist. In certain non-lethal exposures, definite behavioral changes have occurred. There also appears to be a change in mammals, when exposed to SHF, in the sensitivity to sound, light, and olfactory stimuli (55).

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2. (U) Because of the possible behavioral changes and reactions to other important stimuli and the emphasis the Soviet Union has placed on SHF research, a more detailed discussion of this subject appears later in this report.

PART G - Deprivation

(U) The behavior effects on man from the deprivation of food, sleep, and sensory stimuli have been studied by the Soviet Union. As mentioned in Section II of this report, certain forms of deprivation to humans is in current use. This area is very important in the discussion of controlled offensive behavior and it is clear that the Soviet Union is well aware of this potential. Because one is able to apply deprivation techniques in controlled situations as well as in the field, it will be discussed in detail in a later section of this report. Hahn (56) provides further discussion on the areas mentioned in this section to include fear phenomena, anxiety and stress, and cultural background. These specific areas are not mentioned specifically as separate sections in this report because they become interlaced with the other areas of major concern.

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PART II

PARAPSYCHOLOGY IN THE SOVIET UNION

SECTION I - BACKGROUND

1. (U) The science of parapsychology includes special sensory bio-physical activities, brain and mind control, telepathic communications or bioinformation transceiving, bioluminescent and bioenergetic emissions, and the effects of altered status of consciousness on the human psyche. The Soviets prefer the term biocommunications instead of the term para-psychology. Other terms that may appear in the Soviet literature that normally mean parapsychology are: psycho-physiology, psychotronics, psychoenergetics, or biophysical effects. The term parapsychology (biocommunications) as used in this report denotes a multi-disciplinary field consisting of the sciences of bionics, biophysics, psychophysics, psychology, physiology, and neuropsychiatry (57,58).

2. (U) The broad area of biocommunications can be further subdivided into two general classifications: Bioinformation and Bioenergetics. Bioinformation includes paranormal events between living organisms (telepathy, precognition) and events between living organisms and the inorganic world. Bioenergetics denotes those activities such as biological location and indicator techniques, bioenergetic therapy using electromagnetic fields, and psychokinesis, or the influence of mind upon matter. The definitions of the terms Biocommunications, Bioinformation, and Bioenergetics are given in Table III which appeared in the Mankind Unlimited Research report. The basic definitions are based on information provided by Ryzl (59). It should be mentioned that parapsychology was accepted in 1969 as a legitimate field of science and scientific research by the American Association for the Advancement of Science (AAAS).

TABLE III

BASIC TYPES OF BIOCOMMUNICATION PHENOMENA (U)

General: Biocommunications

A new branch of science involved with the human capability of obtaining information from other than the normal senses and the ability to respond to or reasonably interpret such information. Biocommunications, also synonymous with para-psychology, is, however, distinct from other sciences in that it is primarily concerned with researching the exist-ence of a definite group of natural phenomena controlled by laws which are not based on any known energetic influence.

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TABLE III (Cont)

TYPE I: BIOINFORMATION (U)

Those phenomena associated with the obtaining of information through means other than the normal sensory channels e.g. through extrasensory perception (ESP). There are several forms of ESP, including:

a. Telepathy, transmission or "reading" of thoughts refers to the extrasensory reception of information about the mental processes of others.

b. Proscopy or precognition - While the above forms appear to differ only in the nature of the object about which information is received, numerous observations indicate that precognitive ESP involves, under certain circumstances, trespassing the barrier of time to obtain information about future events.

c. Paragnosia or clairvoyance refers to the extrasensory reception of information about objective events in the outer world.

TYPE II: BIOENERGETICS (U)

Those phenomena associated with the production of objectively detectable effects through means other than the known energetic influences. Seemingly incredible effects have been reported, such as the movement of distant objects without any detectable use of physical force (telekinesis), antigravitational effects, transformations of energy, electromagnetic effects arising without adequate physical cause, and chemical reactions and biological processes occurring through mental concentration.

3. (U) Scientists in pre-revolutionary Russia were studying the area of parapsychology as did later such Soviet scientists as V.M. Bekhterev, A.G. Ivanov-Smolensky and B.B. Kazhinsky in the twenties and thirties (60,61). In 1922, a commission composed of psychologists, medical hypnotists, physiologists, and physicists worked on parapsychology problems at the Institute for Brain Research in Petrograd (Leningrad). Work flourished throughout the thirties with research being reported

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in the literature in 1934, 1936, and 1937 (62). After 1937 further experiments in the field of parapsychology were forbidden. During Stalin's time, any attempt to study paranormal phenomena might have been interpreted as a deliberate attempt to undermine the doctrines of materialism.

4. (U) According to Dodge (63) in 1964, the Aerospace Technology Division of the Library of Congress reviewed the Soviet literature in an unpublished bibliography entitled, "Soviet Parapsychology" (ATD Report U-64-77). At that time, academic opposition to parapsychology in the USSR had reached its zenith which led ATD observers to the reasonable conclusion that official Soviet support or funds for parapsychological research were unlikely and that investigation in this area might be terminated.

5. (U) The above conclusion was apparently misguided because of events that occurred in 1959 and 1960. In 1959 a book entitled Mysterious Phenomena of the Human Psyche was published in the USSR. Its author was Professor L.L. Vasilev, head of the Department of Physiology of Leningrad University and a corresponding member of the Academy of Medical Sciences of the USSR (64). A year later, Professor Vasilev was given state funds to establish at the University appropriately equipped laboratories for the study of telepathy. The published findings from this laboratory attracted attention and began to find repercussions in the columns of the non-specialized periodical press (65-70). This was followed by a publication in 1962 by Kazhinskiy (71). Following the example of Leningrad, other cities, including Moscow, Kiev, Novosibirsk and Kharkov, established similiar laboratories and research centers, at which not only the phenomena described in world literature were examined, but a study was made of parapsychic features displayed by Soviet citizens. The journal Science and Religion (72) has published many articles on Soviet parapsychology, including a discussion of whether it was worth-while continuing research in this field (1965). Affirmative, though extremely cautious, replies to this question were given by Vice President of the Academy of Sciences, N.N. Seminov, by Academicians M.A. Leontovich, A.L. Mints and G.M. Frank, and by Professors A.N. Leontev and V.F. Asmus (73). This brief survey brings the study of paranormal phenomena up to the time when studies of a more pertinent nature to this report have begun.

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SECTION II - SIGNIFICANCE OF PARAPSYCHOLOGY IN THE USSR

1. (U) The Soviet Union is well aware of the benefits and applications of parapsychology research. In 1963, a Kremlin edict apparently gave top priority to biological research, which in Russia includes parapsychology (74). The major impetus behind the Soviet drive to harness the possible capabilities of telepathic communication, telekinetics, and bionics is said to come from the Soviet military and the KGB (57). Today it is reported that the USSR has twenty or more centers for the study of parapsychological phenomena, with an annual budget estimated in 1967 at over 12 million rubles (13 million dollars) and reported to be as high as 21 million dollars (1,57,75).

2. (U) According to a report by Velinov (76), Soviet interest in biocommunications was clearly indicated in 1965 when the Department of Bioinformation of the Scientific and Technical Society of Radio Engineering and Telecommunications was established at the Popov Institute in Moscow. Its stated objectives are to discuss physical, biological, and philosophical aspects of bioinformation and to acquaint the Soviet scientific community with biocommunications research conducted outside the Soviet Union.

3. (U) Soviet parapsychology research was actually stimulated by the 1960 French story (77) concerning the US atomic submarine Nautilus. The French journalists splashed the now rather infamous Nautilus story in headlines "US Navy Uses ESP on Atomic Sub!" Ship to shore telepathy, according to the French, blipped along nicely even when the Nautilus was far under water. "Is telepathy a new secret weapon? Will ESP be a deciding factor in future warfare?" The speculating French sensationalized, "Has the American military learned the secret of mind power?" In Leningrad the Nautilus reports went off like a depth charge in the mind of L.L. Vasilev. In April of 1960, Doctor Vasilev, while addressing a group of top Soviet scientists stated:

> "We carried out extensive and until now completely unreported investigations under the Stalin regime. Today the American Navy is testing telepathy on their atomic submarines. Soviet scientists conducted a great many successful telepathy tests over a quarter of a century ago. It's urgent that we throw off our prejudices. We must again plunge into the exploration of this vital field." (78)

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Although the US Navy subsequently denied the reports of telepathic testing on atomic submarines, the Soviet hierarchy apparently heeded Doctor Vasilev's advice and gave support, both moral and financial, to his dynamic view that: "The discovery of the energy underlying telepathic communication will be equivalent to the discovery of atomic energy (62).

4. (U) Since 1962, Doctor Vasilev has headed a special laboratory for biocommunications research at the University of Leningrad. Major aspects of the work of this laboratory are to conduct research and to develop machines capable of monitoring, testing and studying telepathic communication (79).

5. (U) In 1963, Doctor Vasilev claimed to have conducted successful long-distance telepathic experiments between Leningrad and Sevastapol, a distance of 1200 miles, with the aid of an ultra-short-wave (UHF) radio transmitter. As a result, Doctor Vasilev was convinced that his experiments, and those he conducted jointly with the Moscow-based Bekhterev Brain Institute, offered scientific proof of telepathic communications. His next goal was to identify the nature of brain energy that produces it (59).

Theorizing on the above experiments, one Soviet scientist suggested that telepathic impulses are radiated along the lines of bits of information in a cybernetic system. Another scientist is known to be working on the idea of time as energy, speculating that telepathic transmissions may be propagated through a supposed time-energy system, rather than through the electromagnetic field.

6. (U) Soviet research into biocommunications phenomena does not appear to be earth-bound and limited to inner space, but apparently extends to outer space as well. The so-called Father of Soviet Rocketry, K.E. Tsiolkovsky, stated that:

> "In the coming era of space flights, telepathic abilities are necessary. While the space rocket must bring men toward knowledge of the grand secrets in the universe, the study of psychic phenomena can lead us toward knowledge of the mysteries of the human mind. It is precisely the solution of this secret which promises the greatest achievements." (80)

There are reports that the Soviets are training their cosmonauts in telepathy to back-up their electronic equipment while in outer space. One of these back-up schemes is known to involve coded

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telepathic messages. This method was previously demonstrated in March 1967, when a coded telepathic message was flashed from Moscow to Leningrad (81). The involvement of astronauts or cosmonauts in telepathy experiments is not necessarily unprecedented. In February 1971, during the Apollo 14 flight to the moon, astronaut Edgar Mitchell made 150 separate attempts to project his thoughts from inside the space capsule back to an individual on earth. The results of the Apollo 14 experiments have been well-documented in detail and are published in the Journal of Parasychology (82). Further documentation of Mitchell's experiments can be found in the University of California Newsletter (83).

7. (U) There are numerous reports on Soviet applications of clairvoyance, hynotism, dowsing, etc., in military operations. In the case of dowsing, this is also not unprecedented, since US forces have employed dowsing in Vietnam for locating enemy tunnels and caches. With respect to brain and mind control/ conditioning, a recent report indicates that the Soviet Union has made great strides in emotional training and conditioning. Soldiers are being taught to set their own emotional tone in battle and stress situations. Further, astronauts are being taught through such mental conditioning to distort time and to offset boredom in outer space (84).

8. (U) Man's sight and hearing are limited to a relatively small range of wavelengths, other living beings often possess much wider perceptive capabilities, both with regard to sharpness of perception and range of stimuli. For example, dogs hear higher sound frequencies than man; bats and dolphins orient themselves by means of an ultra-sound radar; bees perceive colors even in the ultraviolet part of the spectrum; some snakes perceive minute differences in temperature and orient themselves by means of thermoreceptors. Certain living beings even react to stimuli to which man is absolutely insensitive. Some species of fish and homing pigeons, for instance, react to changes of the electric or magnetic field in their surroundings (59). In view of these perceptive processes, it has been difficult to differentiate between those sensory processes which are merely sharpened or highly honed and those that are extra or super-normal. Certain military advantages would come from the application and control of these perceptive processes. For example, such application and control could be used in the detection and identification of animate objects or humans through brainwave interactions, mass hypnosis or mind control through long-distance telepathy, thermal receptors, and sensitivity to changes in magnetic/electrical/ gravitational fields.

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9. (U) According to observations made by Doctor Montague Ullman (M.D.) during a trip to the Soviet bloc countries in the fall of 1970, Soviet biocommunications investigations are effectively combining the use of modern and sophisticated technology with basic pragmatic approaches. This was evident, he states, in their approach to long-distance telepathy experiments where the results were analyzed in physiological (electroencephalographic data) as well as phychological task performance (transmission of data in Morse Code) (85). Doctor Ullman further observed that the Soviet researchers seemed intent on confirming the existence of a new form of energy, referred to as bioplasma, which they maintain is characteristic of life processes and represents matter in the form of an integrated system of elementary charged particles. Such energy, through interaction with other systems, is thought to provide the basis for biocommunications (86).

10. (U) The above commentary documents a clear case for research in the Soviet Union in parapsychology. It is significant because of the energy and resources being allotted for this work in the Soviet Union and because of its military implications especially in mind manipulation and controlled offensive behavior. The more sinister aspects of paranormal research appear to be surfacing in the Soviet Union. Why else would Soviet researchers make the statement:

> "Tell America that the psychic potential of man must be used for good." (75)

SECTION III - THE APPORT TECHNIQUE

1. (U) The following discussion on apports and astral projection is not intended to be an endorsement for its scientific verification or even its existence. However, reputable scientists in the USSR and the US are keenly interested in this phenomenon. Areas that appear to have potential must be discussed, even if only briefly.

2. (U) According to Welk (87), a costly weakness in our intelligence system, to a large extent, is an inability to use effectively the resources of the science of parapsychology (there are some definite indicators that the Soviets realize the potential of "psi" which will be reported later in this section). Whenever parapsychology is mentioned, most people are likely to think of ESP. However, there are other types of parapsychological phenomena which are just as important militarily as ESP. Welk claims, based on many Soviet sources, that the so-called "apport" technique is likely to meet valuable intelligence needs. When

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fully developed, this technique would make possible the abduction of actual objects (including documents) in enemy territory and there transfer to friendly territory. Objects so abducted are known as "apports." They could be returned to the point of origin without the enemy becoming aware of this temporary abduction.

3. (U) Some of the world's most eminent scientists from the late 1800's and early 1900's have claimed to have witnessed apport phenomena. These include Sir William Crookes (1832-1919), British chemist and physicist, discoverer of the element thallium and former president of the British Association for the Advancement of Science (88); Alfred Russel Wallace (1823-1913), British naturalist and co-discoverer, with Charles Darwin, of the theory of evolution (89); Johann K.F. Zoellner (1834-1882), professor of physical astronomy at the University of Leipzig, Germany (90).

4. (U) In the discussion of such an esoteric subject as apports, it is deemed sufficient to relate only one experience claimed to have occurred to Sir William Crookes. The interested reader can consult the non-cited bibliography for further references. The following account is taken from pp. 87 and 88 of reference 88:

> "Class IX. The Appearance of Hands, either Self-luminous or Visible by Ordinary Light."

....."I (William Crookes) will here give no instances in which the phenomenon has occurred in darkness, but will simply select a few of the numerous instances in which I have seen the hands in the light.

.....I have more than once seen, first an object move, then a luminous cloud appear to form about it, and lastly, the cloud condense into shape and become a perfectly formed hand.... It is not always a mere form, but sometimes appears perfectly life-like and graceful, the fingers moving and the flesh apparently as human as that of any in the room. At the wrist, or arm, it becomes hazy, and fades off into a luminous cloud. To the touch, the hand sometimes appears icy cold and dead, at other times warm and life-like, grasping my own with the firm pressure of an old friend. I have retained one of these hands in my own, firmly resolved not to let it escape. There was no struggle or effort made to get loose, but it gradually seemed to resolve itself into vapor and faded in that manner from my grasp."

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5. (U) It is a known fact that the Soviet Union takes the appearance of luminous bodies very seriously as evidenced by the Kirlian photography of the human body's aura (91). It appears that the Soviets may be considering that a hand which appears out of nowhere and can grasp, "with the firm pressure of an old friend," another person may have first-rate military possibilities. There has been some discussion recently about the prospects of being able to control the apport technique to a point of sophistication where individuals could control these "luminous clouds." The individuals who have studied these effects (real or otherwise) have suggested that since these bodies can travel unlimited distances and are able to pass through solid material (walls), they might well be used to produce instant death in military and civilian officials. It is further conjectured that these bodies could disable military equipment or communication nets.

6. (U) If one reads the cases and experiments mentioned here, as well as references two through nine under PART II of the non-cited bibliography, he can make certain deductions. If any of this highly questionable material is true then it can be inferred that organic matter can be transformed into "ectoplasm," that this can be rendered invisible and impalpable and thus converted into something which, for all practical purposes, amounts to force. If organic matter can be converted into such "force-matter," it seems reasonable to assume that a physical object, if similarly converted, could travel through space.

7. (U) Two things are certain: (1) that parapsychological phenomena are due to the little-known faculties of the subconscious mind; and (2) that the powers of the subconscious mind are vastly superior to those of the normal consciousness. The fantastic memory of the subconscious mind (sometimes referred to as "photographic memory") is a well-established fact. So is its extraordinary mathematical ability, which has baffled trained mathematicians no end. It seems probable that some of these little-understood faculties of the subconscious mind have something to do with its ability to put together again an object which it had previously disintegrated, and to manipulate the forces involved in this process. The only way one can learn more about these little-understood processes is through intensive study and experimentation. The stakes seem high enough.

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8. (U) While the process by which matter is converted into "force-matter" (and vice versa) may not be understood, nevertheless, one is faced with the possibility that the human mind can disintegrate and reintegrate organic matter - a feat which seems far more complex than the disintegration and reintegration of, say, a stone, a piece of wood, paper, etc. Experiments show that a human body which has lost about half its weight can be reintegrated without loss of normal functions. Since this is possible, it does not seem safe to exclude - without further investigation - the possibility that inorganic matter might undergo a similar disintegration and reintegration. After all, apport phenomena in which physical objects have passed through solid walls have been observed and attested to by some of the world's most eminent scientists as well as by a host of other responsible witnesses. In view of what the human mind has demonstrated it can do with organic matter, and in view of the very real Soviet threat in this sector, the science of parapsychology should be investigated to its fullest potential, perhaps to the benefit of national defense.

9. (U) According to Pullman (92), Director of the Southeast Hypnosis Research Center in Dallas, Texas, before the end of the 1970s, Soviet diplomats will be able to sit in their foreign embassies and use ESP (in this case a form of the apport technique) to steal the secrets of their enemies. (See also reference 91, p. 216) Pullman states that a spy would be hypnotized, then his invisible "spirit" would be ordered to leave his body, travel across barriers of space and time to a foreign government's security facility, and there read top-secret documents and relay back their information. Such "astral projection" already has been accomplished in laboratory settings, Pullman said, adding that the Russians are probably now trying to perfect it. Pullman further states that the Soviets are at least 25 years ahead of the US in psychic research. According to Pullman, the Soviets have realized the immense military advantage of the psychic ability known as astral projection (out-of-the-body travel). In this reference, details are given for some of Pullman's work in the US with astral projection. Other scientists and mediums interested in this work are professor H.A. Cahn of Northern Arizona University (92), Doctor Charles Tart of the University of Southern California (91,92), and Doctor V. Inyushin of Alma-ata (91). Sybil Leek, noted astrologer and author, states, "there is great danger that within the next ten years the Soviets will be able to steal our top secrets by using out-of-the-body spies." Further reading, although much older, can be found in a book by Muldoon and Carrington (93). Suggested background reading on astral projection can be found in an excellent article by J. Fraser Nicol in Psychic (94).

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SECTION IV - ESP AND PSYCHOKINESIS

1. (U) The reader by this time has realized that it is very difficult to speak of one area of psychic phenomenon without overlapping into other areas. There really can be no distinct separation, for example, between apports and certain aspects of telepathy; hypnosis also enters into this area. In an attempt to illustrate the various subjects in parapsychology, however, artificial sections were established. This is the reason for a separate part in apports and ESP. Some aspects of hypnosis, depending on its ultimate use, falls within parapsychology, some areas into medicine; therefore, hypnosis is presented as a separate section outside of this parapsychology discussion.

2. (U) Soviet research in ESP was started in the 1920's at Leningrad University by V.M. Bekhterev. In his early work, Bekhterev collaborated with V.L. Durov to investigate the effects of mental suggestion on a group of performing dogs (62). It was believed that telepathic communication depended on electromagnetic radiation. Doctor L.L. Vasilev (95-97), shown in Illustration One, at the Bekhterev Brain Institute set out to identify these electromagnetic waves that carry telepathy. By 1937, Vasilev had amassed evidence that known electromagnetic waves do not carry telepathy. Tests were conducted in electrically shielded chambers and over extreme distances denying the passage of electromagnetic fields (98). Some of the long range telepathy experiments have been published (63,99,100) explaining the various techniques employed including classical tests with Zener cards and more unique tests with strobe lights and codes.

Illustration One - Professor L.L. Vasilev, pioneer Soviet parapsychologist considered the father of Soviet psychical research.

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3. (U) Professor L. Vasilev died in late 1965 or early 1966 and the task of continuing telepathy research was taken by Doctor I. Kogan. Doctor Kogan is chairman of the Bio-Information Section of the Popov Radio and Technical Institute in Moscow. This individual is still trying to wed telepathy to the electromagnetic spectrum (101,102). Discussion as to the existence of telepathy has been bandied about the Soviet Union (103) and elsewhere (104) for some time. For the sake of research the Soviet Union accepts the validity of ESP even though the argument as to the mode of transmission continues. Professor E.K. Naumov (105), Chairman of the Division of Technical Parapsychology at the A.S. Popov Institute mentioned above, conducted long range telepathy tests from Moscow to several other cities. Illustration Two is a photograph of Naumov with associates.

Illustration Two - Sender Y. Kamenshi (left), Soviet physicist, and receiver K. Nikolaev, Soviet actor, with parapsychologist Edward K. Naumov (far right).

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4. (U) In 1967, the Soviet Maritime News reported, "Cosmonauts, when in orbit, seem to be able to communicate telepathically more easily with each other than with people on earth. A psi (short for psychic faculty) training system has been incorporated in the cosmonaut training program," but the News provided no further details. Some informal reports relayed to Ostrander and Schroeder (106) indicate that the Soviets are working on psi systems for space use, involving not just telepathy, but also precognition.

5. (U) Kogan's systematic parapsychology research (102) could also be of potential value to the overall Soviet cybernetic research and development program. Efforts being made to optimize sensory inputs in the interest of controlling the quality of human motor activity are well known, as is the ultimate Soviet goal of achieving a perfect cybernetic man. It is of interest that both conventional psychology and parapsychology programs are headquartered in Moscow, although as depicted in the personnel and institute section the trend is decentralization, is probably no coincidence and supports the view that the latter program should not be taken lightly.

6. (U) As mentioned above, the Soviets seem preoccupied with the search for the energy that carries or facilitates telepathy transmission. Is it electromagnetic or not? The search for this unknown energy has led the Soviets to Kirlian photography; named after its inventors Semyon and Valentina Kirlian. The Kirlians developed a technique of photographing with a high frequency electrical field involving a specially constructed high frequency spark generator, tuned up and down between 75,000 to 200,000 electrical oscillations per second. Their first photographs showed turquoise and reddish-yellow patterns of flares coming out of specific channels within leaves. A magnified picture of a finger showed craters of light and flares (Illustration Three). By the 1960s research on bioluminescence revealed by Kirlian photography was going on in many Soviet universities. Perfected techniques of photographing the play of high-frequency currents on humans, plants and animals, as well as on inaminate matter have set the Soviets on some striking discoveries about the energetical nature of man. "Bio-plasma" is a term coined by the Soviets for bio-luminescent phenomenon or energy. Scientists at the Kazakh State University at Alma-ata have found that illnesses tend to show up in advance as a disordered play of flares from the "bio-plasma" long before they manifest in the physical body. According to Ostrander and Schroeder, the Soviets may be attempting to link Kirlian photography with computers, among other things, to instantly analyze the spectra of colors appearing in the vari-colored flares from the living body.

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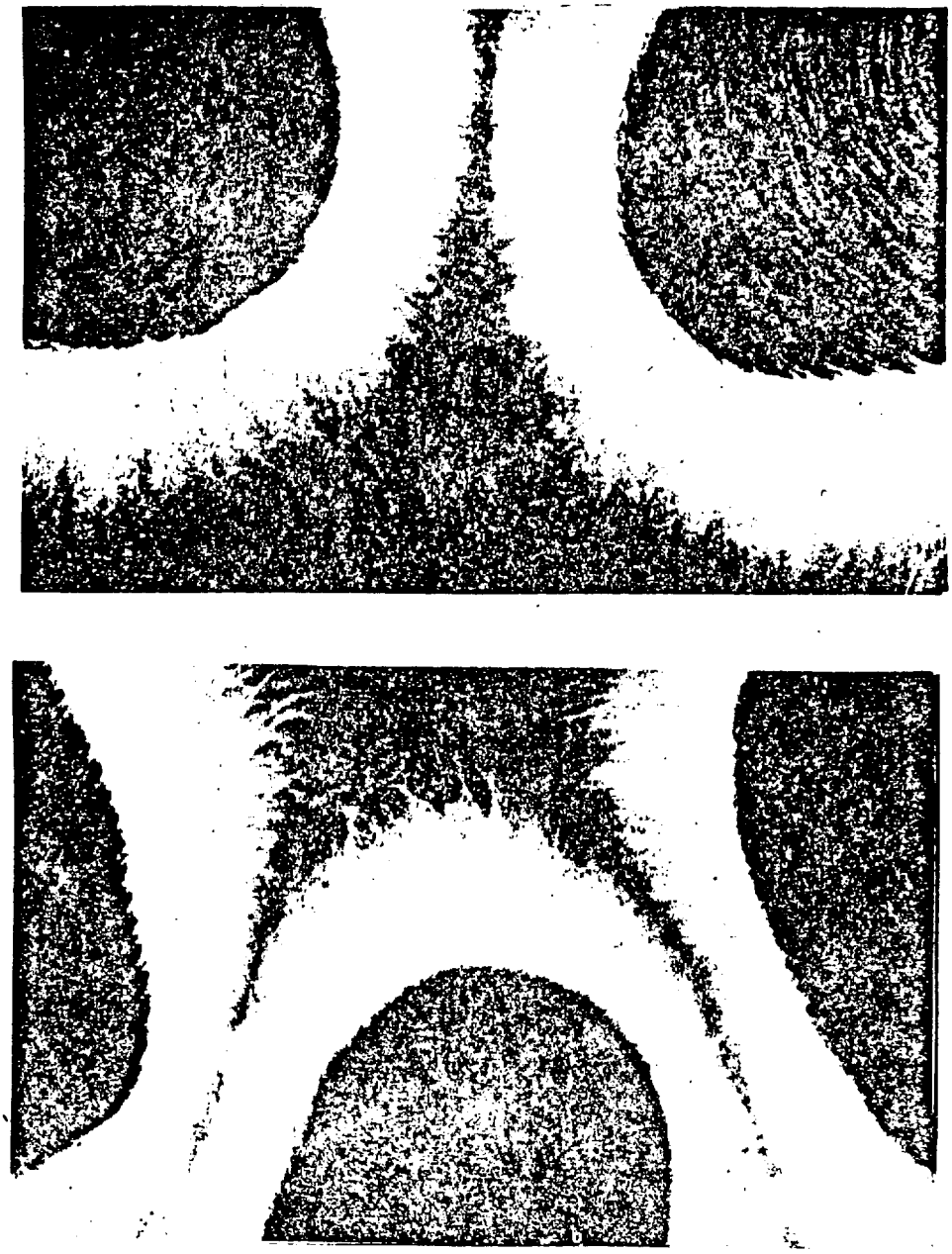

Illustration Three - Upper photograph displays flares of energy from fingers of the left and right hand of an individual by Kirlian photography. Lower photograph shows the fingers of three different people and how the aura of "energy" of each remains intact, yet interplays in long thread like fibers in the open area between them.

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7. (U) It is believed that if there is any positive basis for Kirlian photography and the "bio-Plasma" body of humans, the Soviets may be closer than is thought on the controlled use of the apport techniques and possible astral projection phenomenon.

8. (U) Doctor A. Podshibyakin, an electrophysiologist at the Institute of Clinical Physiology in Kiev, has found that by charting acupuncture points a correlation exists between the "bio-plasma" and changes on the surface of the sun. At the exact moment solar flares (sun spots) occur, there are changes in the electrical potential of the skin's acupuncture points. These electrical charges are measured by a tobiscope (probably a simple wheatstone bridge device). In some way, the "bio-plasma" of the body is sensitive to these solar explosions the instant they occur even though it takes about two days for the cosmic particles to reach the earth.

9. (U) The most significant use of Kirlian photography is in the area of psychokinesis or mind over matter (PK). Doctor Genady Sergeyev (75) of the A.A. Uktomskii Military Institute in Leningrad believes Kirlian photography may uncover the mechanism of PK. Sergeyev is a prominent mathematician for the Soviet military who works closely with an electrophysiologist from the University of Leningrad, Doctor L. Pavlova. Sergeyev has devised important mathematical and statistical methods for analyzing the EEG (107) which allowed parapsychologists to follow and depict the actions of telepathy in the brain (108). The type of work reported by Sergeyev in 1967 and 1968 is just now beginning to appear in the US efforts to understand the transmission of telepathy (109,110). Sergeyev has conducted several years of intensive lab research on the outstanding PK psychic in Leningrad, Nina Kulagina (pseudonym Nelya Mikhailova). Illustration Four is a photograph of Doctor G. Sergeyev and Illustration Five is a photograph of Mrs. Kulagina. Sergeyev registered heightened biological luminescence radiating from Kulagina's eyes during the apparent movement of objects by PK. Sergeyev postulates that the "bio-plasma" of the human body must interact with the environment to produce PK. Sergeyev emphasizes when target objects are placed in a vacuum, Kulagina is unable to move them. Barcus (111) in the United States reports some unusual occurrences during psychic photography especially of the eyes. Reportedly, Kulagina has caused the movement of a wide range of non-magnetic objects: (under strict scientific control) large crystal bowls, clock pendulums, bread,

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matches, etc. In one test, a raw egg was placed in a salt solution inside a sealed aquarium six feet away from her. Researchers report she was able to use PK to separate the yoke from the white of the egg. Observations by Western scientists of Mrs. Kulagina's PK ability has been reported with verification of her authentic ability (112,113). These same Western scientists have reported that as of February 1971, they have not been able to visit or observe Mrs. Kulagina. A veil of secrecy has been placed on Sergeyev and Mrs. Kulagina for unknown reasons.

10. (U) Rather than simply observing PK, the Soviets typically turned to instrumentation. Mrs. Kulagina was subjected to a number of physiological electronic measuring devices and tested for important body functions during her PK demonstrations. The Soviets found that at the moment an object begins to move, all of Mrs. Kulagina's body processes speed up drastically - heart, breathing, brain activity - and the electromagnetic fields around her body all begin to pulse in rhythm. Soviet researchers postulate that it was these rhythmic "vibrations" that cause objects to be attracted or repelled to her. Illustration Six shows a photographic sequence of Kulagina's PK ability.

11. (U) Scientists report (113) that Kulagina has been able to stop the beating of a frog's heart in solution and to re-activate it! This is perhaps the most significant PK test done and its military implications in controlled offensive behavior, if true, are extremely important.

12. (U) Space does not permit a discussion on other important parapsychological phenomena such as eyeless sight (75,114-129), which appeared to be more of a fad than anything else. However since the mid 1960s, the "eyeless sight" fad has subsided and serious research has proceeded quietly at the State Pedagogical Institute in Sverdlovsk, off bounds to foreigners (75). Space in this report does not permit a discussion of psychotronic generators, devices which are reported to be able to store human bio-plasmic forces for later use (75). For further reading on ESP, see the non-cited bibliography; Section V, numbers 12-30.

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Illustration Four - Photograph of G.A. Sergeyev, prominent scientist at A.A. Uktomskii Military Institute, Leningrad with an assistant.

Illustration Five - Nina Kulagina, who reportedly moves objects by sheer will (PK).

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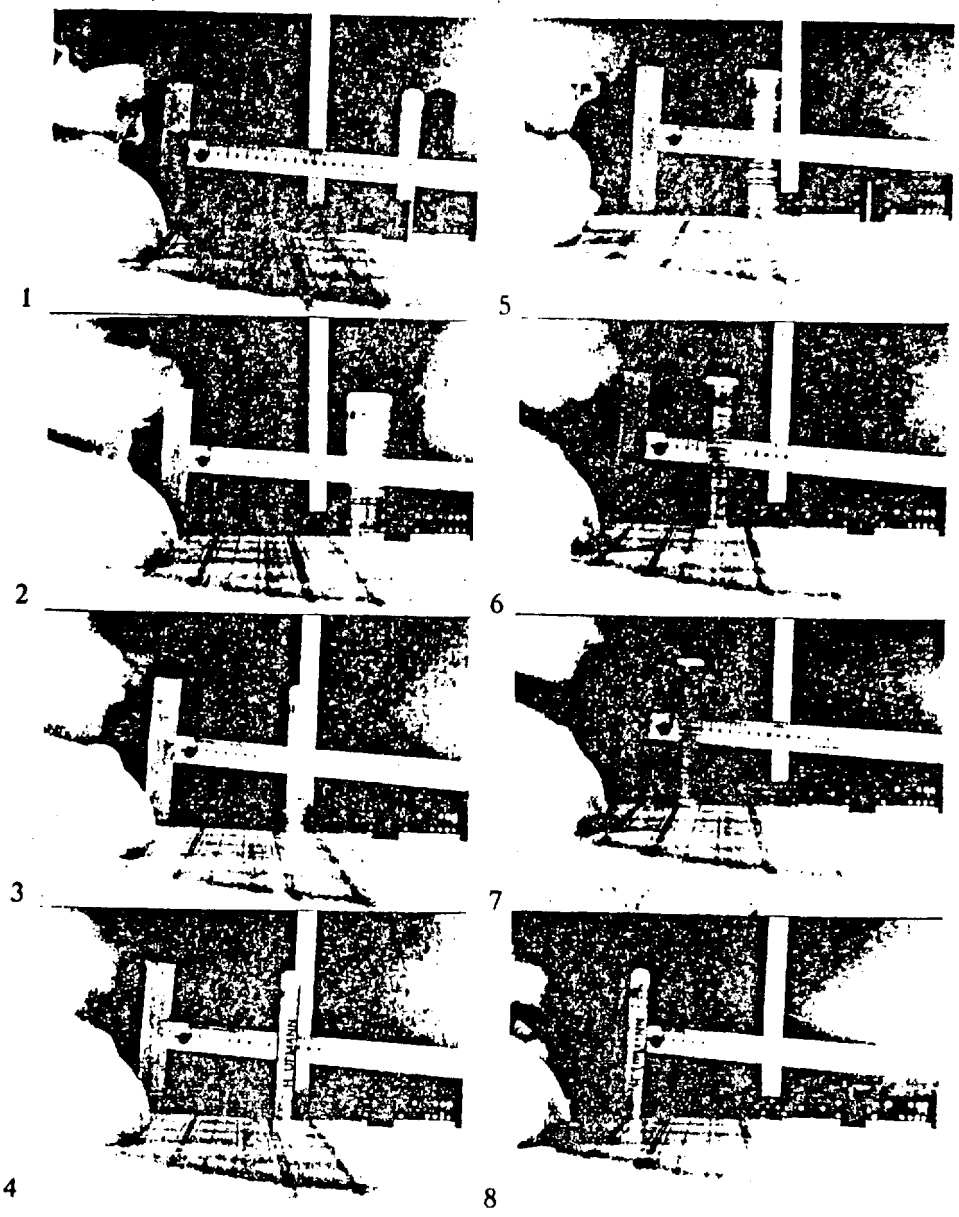

Illustration Six - This series of photos shows Nina Kulagina moving a metallic cigar tube by PK. Scale in background is in centimeters.

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SECTION V - SUMMARY AND MILITARY IMPLICATIONS

1. (U) The following discussion is based on a report by Ostrander and Schroeder (75). The authors ask the question, "Is ESP a weapon of war?" All research on ESP in the USSR is funded by the government. The authors claim that their sources indicate that psi research with military potential is well-financed by the Soviet Army, KGB, and other paramilitary agencies. Soviet scientists doing psi research in nonmilitary areas often have trouble obtaining funds. Doctor Milan Ryzl (131) reports that secret psi research associated with state security and defense is going on in the USSR. Communist state authorities, the military and the KGB display an unusual, disproportionate interest in parapsychology. The Soviets are attempting to apply ESP to both police and military use (See appendix VI for biographic data on Ryzl). According to Ryzl, some years ago a project was begun in the USSR to apply telepathy to indoctrinate and re-educate antisocial elements. It was hoped that suggestion at a distance could induce individuals, without their being aware of it, to adopt the officially desired political and social attitudes. Research in this field of endeavor will hopefully become clearer in the section on hypnosis later in this report. Reports of psi research in Soviet submarines help confirm military involvement in parapsychology. According to Stone (74), there is clandestine psi research going on at the Pavlov Institute of Higher Nervous Activity in Moscow, the Durov Institute, and certain areas in Sibera. Obviously, telepathy and clairvoyance would make ideal additions to a spy arsenal and such undercover groups are constantly said to be supporting ESP research in the USSR. "One conclusion seems justified," says Doctor Ryzl (130). "Parapsychology in Communist countries and especially the USSR occupies a strong position. We can expect it to be developed with determination." According to Ostrander and Schroeder, the USSR is ahead of the US in certain areas of technical psi research. The authors report that the USSR is ahead of the US in discoveries about the physical essence of the human being and how psi functions in and through us. They are ahead of the US in uncovering the basic energy behind psi. They are ahead of the US in attempts to control factors like the influence of magnetic weather on psi tests. They appear to be ahead of the US in seeking out and creating conditions that unlock the psi potential present in every human being.

2. (U) In summary, what is the strategic threat posed by the current "explosion" in Soviet parapsychological research? Soviet efforts in the field of psi research, sooner or later, might enable them to do some of the following:

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a. Know the contents of top secret US documents, the movements of our troops and ships and the location and nature of our military installations.

b. Mold the thoughts of key US military and civilian leaders, at a distance.

c. Cause the instant death of any US official, at a distance.

d. Disable, at a distance, US military equipment of all types including space craft.

3. (U) It is generally conceded that the above four areas sound like science fiction, however, the literature appears to support (b) as being the most possible use of psi phenomena during the time frame of this study. Again from Ostrander and Schroeder who cite Oliver Caldwell, an expert on Soviet affairs and past-acting commissioner for International Education in HEW, as follows:

> "I am amazed at the skepticism and sometimes hostility which I encounter when I try to tell Americans about some of the experimentation which is taking place in the USSR in parapsychology and related fields. I find this strange because there is available documentation in translation which substantiates most of the things I saw in the USSR. I am really disturbed, because if the United States does not make a serious effort to move forward on this new frontier, in another ten years it may be too late."

4. (U) In closing this section on parapsychology a quote from astronaut Edgar D. Mitchell, Jr. is appropriate (131).

> "Extrasensory perception is not a matter of belief. There is a great deal of serious scientific work being done in it, and it has been established over the last thirty years that it is a matter of probability, and the probabilities have been established beyond chance. I think it is an important work. I happen to be curious about it, and thus have been pursuing it for many years. This happened to be an opportunity (Apollo 14 lunar mission) to do another little step - a piece in the scientific puzzle of what man's all about."

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PART III

MENTAL SUGGESTION AND CONTROLLED BEHAVIOR

SECTION I - HYPNOSIS

PART A - The Use of Hypnosis in Medicine - USSR

1. (U) In the latter half of the nineteenth century, many French and German researchers began to use hypnosis as a therapeutic aid and to study the way in which it worked. In the Soviet Union, pioneer work in hypnosis was undertaken by V. Danilyevski, A. Tokarski, and V. Bekhterev (see Part II, Section IV).

2. (U) V. Danilyevski discovered that the major characteristics shown by man in a state of hypnosis, such as lower sensitivity, "wax-like" flexibility of muscles and joints, and suppressed movements, were also typical of animals in a similar state. This led him to assert that hypnosis in man was identical in nature to hypnosis in animals. A. Tokarski proved that hypnosis and suggestion, like other psychical phenomena were determined entirely by the influence of the environment on man. He wholeheartedly supported the view that hypnosis was an effective treatment for a wide variety of disorders. V. Bekhterev applied hypnosis widely for treatment. He maintained that verbal suggestion played a big role in developing a state of hypnotic sleep; physical stimuli merely facilitated the achievement of this state. I. Pavlov advanced a scientifically based theory of the nature of hypnosis and its potential use as a method of treatment. In 1935 he described hypnosis as "the standard method in the physiological struggle against the pathogenic agent." Pavlov's school gave experimental support to the view that hypnosis was a specific variety of sleep, long before that view had been arrived at empirically. This view had already been advanced in the last century by most doctors and scientists who were concerned with the theory of hypnosis and its application to therapeutic practice. On the basis of experiments on animals and later on humans, the phasic suppression theory developed into a firm physiological foundation for understanding hypnosis and suggestion and the way in which they work. The theory held that hypnotic sleep is a transitional stage between wakefulness and sleep and that there is an active "watch" point in the cerebral cortex of both hemispheres (rapport).

3. (U) The three generally recognized stages of hypnosis are sleepiness, hypotaxia, and somnambulism or, respectively, light, medium and deep hypnosis. At the first stage of hypnosis, the

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unconditioned responses in most cases hardly differ from the responses in wakefulness. At the second stage, altered unconditioned vascular responses begin to prevail over normal vascular responses to stimulation, and thus give evidence of hypnotic phases in the cortex of both hemispheres. The suppression process is most obvious with regard to extent and intensity at the third stage, the deep stage of hypnosis known as somnambulism. Since there is no vascular response to most of the unconditioned stimuli, this means that complete suppression prevails. The rare unconditioned vascular reflexes are of small magnitude, are extended in time and are characterized by a prolonged latent period.

4. (U) Soviet psychotherapists believe that hypnosis is one of the leading methods for the treatment of mental disorders. The Soviets concentrate on the "word" as an adequate stimulus for the development of the hypnotic state. The tremendous role played by the emotional message carried by the word should not be overlooked. The psychotherapist will achieve results depending on the emotional content of the entire system of contact with the patient. The greater the emotional content the better the results. Soviets recommend that the psychotherapist takes into account not only the meaning of what he is trying to achieve through suggestion, but also the emotional content of his work, his contact with the patient, his confidence in his own abilities, and the effectiveness of psychotherapeutic treatment in general.

5. (U) The Soviets believe that the hypnotic state offers the researcher the means of penetrating into the physiological fundamentals of human thought and behavior. The Russians conceive of no other state (hypnosis) which would enable the scientist to simplify human thought by splitting it into its component parts thus permitting him to get to the root of this most complex of nature's phenomena, to control and subordinate it for purposes of research. K. Platonov, the patriarch of Soviet psychotherapists said (132): "I still maintain that hypnotherapy is the main stem of psychotherapy. Hypnotherapy helps us understand better the mechanisms of all other forms of psychotherapy and, therefore, to master them better."

6. (U) The Soviets stress the use of hypnosis in patients suffering from disorders of the gastrointestinal tract especially if neurotic symptoms accompany such disorders. They further stress the use of hypnotherapy in surgical cases thus providing for a decrease in anesthetic and drug usage. Hypnosis is also being studied for its effectiveness in treating alcohol addiction. At first they approached this problem with the idea of developing an emotionally negative

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nauseous reflex to the taste and smell of alcoholic drinks; this method was later abandoned for lack of positive results. The method now employed is to instill in the patient the view that excessive drinking will inevitably lead to physical and mental destruction. The Soviets seek to change the patient's mental outlook on alcohol and to convince them that drinking is impermissible for moral and ethical reasons. In other words, mental manipulation or behavior alteration.

PART B - Hypnosis and Controlled Behavior

1. (U) The possible military uses of hypnotism has many rather bizarre applications. Although there is no concrete proof that hypnosis will play an important role in controlling behavior in military situations, some uses will be mentioned. Biderman and Zimmer (133) discuss hypnosis and other possible alternatives for defense against brainwashing.

2. (U) The following discussion is based on a report by Estabrooks (134). According to the author, the facts and ideas presented are, so to speak, too true to be good, but no psychologist of standing would deny the validity of the basic ideas involved. Of interest to this discussion are some of the more unfamiliar facets of hypnotism which make it of use in warfare. If hypnotism can be used to advantage, we can rest assured that it will be so employed.

3. (U) One in every five adult humans can be placed into the hypnotic state - somnambulism - of which they will have no memory whatsoever when they awaken. From the military viewpoint there are a few facts which are of great interest. Can this prospective subject be hypnotized against his will? Obviously no POW will be cooperative if he knows that the hypnotist is looking for military information, nor will any ordinary citizen if he suspects that the operator will use him to blow up a munitions plant. The answer to this vital question is yes though hypnotists prefer to say "without his consent" instead of "against his will." There are disguised techniques available for hypnotizing an unsuspecting or unwilling subject. The Soviets believe that telepathy may be one such method.

4. (U) Multiple personality can be caused by hypnotism. One could deliberately set up a condition of multiple personality to further the ends of military intelligence and in the development of the "super spy." In his normal waking state which is called Personality A, or PA, this individual will become a rabid communist.

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He will join the party, follow the party line and make himself as objectionable as possible to the authorities. Note that he will be acting in good faith. He is a communist, or rather his PA is a communist and will behave as such. Then develop Personality B (PB), the secondary personality, the unconscious personality. This personality is rabidly American and anti-communist. It has all the information possessed by PA, the normal personality, whereas PA does not have this advantage. The proper training of a person for this role would be long and tedious, but once he was trained, one would have a super spy compared to any creation in a mystery story. The super spy plays his role as a communist in his waking state, aggressively, consistently, fearlessly. But his PB is a loyal American, and PB has all the memories of PA. As a loyal American, he will not hesitate to divulge those memories, but be sure he has the opportunity to do so when occasion demands. Here is how this technique would work. Let us choose the Cubans as examples. One could easily secure, say, one hundred excellent hypnotic subjects of Cuban stock, living in the United States, who spoke their language fluently, and then work on these subjects. In hypnotism one would build up their loyalty to our country; but out of hypnotism, in the "waking" or normal state, one would do the opposite, striving to convince them that they had a genuine grievance against this country and encouraging them to engage in fifth column activities. So one builds up a case of dual personality. They would be urged in the waking state to become fifth columnist enemies to the United States, but also point out to them in hypnotism that this was really a pose, that their real loyalty lay with this country, offering them protection and reward for their activities. Through them one would hope to be kept informed of the activities of their "friends," this information, of course, being obtained in the trance state. They would also be very useful as "plants" in concentration camps or in any other situations where it was suspected their services might be of use to our intelligence department. Once again these people would have a great advantage over ordinary "informers." Convinced of their own innocence, they would play the fifth column role with the utmost sincerity. This conviction of innocence would probably be their greatest protection. Again, if suspected, no one could obtain from them any useful information. Only a very few key people could throw them into the trance and, without this, any attempt to get information would be useless. There are some difficulties that would be encountered in building up an organization of such personnel. Hardly one somnambulist in ten or even a hundred according to Estabrooks would be suitable for such spy work; and the determining of this suitability would be a difficult task. But, Estabrooks reports, it could be done, and once accomplished would repay amply for all the trouble.

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5. (U) The possibility of creating assassins through hypnotic techniques on POWs exists. As was pointed out above, the subject does not need to be willing to enter into such a condition. Once the captive has been placed in a suitable hypnotic state then one need only to establish the post-hypnotic suggestion or plan for the assassination. After the prisoner is released and returned to his organization, he will carry out his assignment through his unconscious state, while appearing perfectly rehabilitated in his wakeful state. The main problem in the assassin plan is in the area of post-hypnotic reinforcement. There have been some ideas mentioned that suggest one needs to establish the reinforcement pattern during initial hypnosis; some object that will reinforce his goal whenever he looks at it, hears a certain sound, etc. The real problem for the friendly forces is the detection of these mentally altered individuals. At the present time there is no fool proof method of detection. There is no test by which one can discover these agents. Blood pressure, heart rate, electro-encephalograph, psychogalvanic reflex, all these devices which one can use to detect the most subtle bodily changes are worthless for there are no bodily changes. Drugs, at least for the present, appear to be of no value. Further, there are certain safeguards that the hypnotic method provides for the enemy. Most important is the conviction of innocence which the man himself has. He would never "act guilty" and if ever accused of seeking information would act quite honestly indignant, the conviction of innocence on the part of the agent is perhaps his greatest safeguard under questioning by our authorities. The Soviets are aware of the above mentioned possibilities and appear to be using certain aspects of psi research in order to manipulate an individuals mental behavior toward these activities.

PART C - Artificial Reincarnation Through Hypnosis

1. (U) Vladimir L. Raikov, M.D., a Soviet psychiatrist, has claimed that hypnotic phenomenon can be utilized for what he claims to be "artificial reincarnations." For example, Raikov claims that it is possible to hypnotically suggest to a girl who studies violin that she is the virtuoso violinist Fritz Kreisler. It is interesting to note, says Raikov, that her manner of playing at this time is reminescent to that of Kreisler. If so desired, it is also possible to create this capacity in an awake state. Raikov has converted persons who have no desire to paint, invent complex machines, or to play music into masters through hypnosis. Raikov reports that he is able to evoke this mental alteration only when the subject is in an exceedingly deep trance which is

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a new form of an active trance. Existence in a state of hypnosis and simultaneous perception of individual moments of reality is usually characteristic of light, superficial hypnosis, however, as mentioned above, Raikov claims that he uses deep hypnosis. As opposed to normal hypnosis, the new found talents of Raikov's subjects retain in part of their conscious equipment the ability gained by this technique. Raikov explains, "The student is thinking, forming relationships and judgments, acquiring his own experience during reincarnation. Consequently the creative potential he develops, draws out, becomes his own." (75)

2. (U) Raikov has used the EEG to prove his supposition that the trance of reincarnation is a new phenomenon. The usual passive trance of deep hypnosis shows via the EEG alpha rest rhythm. In reincarnation the alpha disappears completely and the EEG shows a pattern like that normally recorded in high wakefulness (135). Reincarnation appears to be the antithesis of sleep.

3. (U) Raikov has worked closely with V. Adamenko, a physicist who reportedly has invented the CCAP (Conductivity of the Channels of Acupuncture Points) device. This machine, it is claimed, registers energy flow in the body using as check points for its electrodes the acupuncture points of traditional Chinese medicine. Adamenko reportedly detects changes in body energy caused by alterations of consciousness and varying emotional states. With subjects attached to the CCAP, Raikov put them through various forms of hypnosis. At the end of many sessions the graphs from the CCAP were checked by Raikov and Adamenko. They claim to have found a pronounced difference between the different forms of hypnosis. They now claim to be able to chart objectively the physical activity of the mind in states of somnambulism and various levels of hypnosis. They report that these states are very hard to measure by any other method. Apparently there is even more activity in the mind during reincarnation than there is when a person is wide awake. This corroborates the EEG findings that reincarnation is a state of "super wakefulness" and that it is a very different animal from regular, passive hypnosis, according to Raikov.

4. (U) Raikov's methods are thought to have great possibilities for treating ailments such as alcoholism and certain neuroses. His experiments are the subject of a film "Seven Steps Beyond the Horizon." (136)

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5. (U) Where the Soviets are going to go with Raikov's work is open to conjecture. There is some indication that the Soviets believe that Raikov's work and the CCAP device may unlock many of the mysteries behind ESP and other psi phenomena. If any of the above is true, this work may be a new way of looking inside and catching the subtle interplay between thought and body, psyche and soma. The CCAP device may have a much wider use than charting the mental states of reincarnated artists.

PART D - Telepathic Hypnosis

1. (U) According to Ostrander and Schroeder (75), the ability to put people to sleep and wake them up telepathically from a distance of a few yards to over a thousand miles became the most thoroughly tested and perfected contribution of the Soviets to international parapsychology. It is reported that the ability to control a person's consciousness with telepathy is being further studied and tested in laboratories in Leningrad and Moscow. The work was started in the early 1920s but was not publicized until the early 1960s. The work was begun by K.O. Kotkov, a psychologist from Kharkov University, in 1924. Kotkov could telepathically obliterate an experimental subject's consciousness from short distances or from the opposite side of town. The work was documented by Vasilev (62) who conducted research of his own but could not reveal it under Stalin's regime. The reality of telepathic sleep-wake, backed by columns of data, might be the most astonishing part of Vasilev's experiments in mental suggestion. See reference 62, pages 75 through 88.

2. (U) Parapsychologists in Leningrad and Moscow are involved in the telepathic manipulation of consciousness, now recording successes with the EEG. Doctor V. Raikov (see PART C of this section) is involved in this EEG research as well as E. Naumov. Naumov reports that mental telepathy woke up a hypnotized subject (by telepathy) six of eight times. Naumov remarked that as soon as the telepathic "wake up" is sent, trance becomes less and less deep, full consciousness returning in twenty to thirty seconds (137). In the Leningrad laboratory of Doctor Paul Gulyaiev (Bekhterev Brain Institute), friends of subjects have been trained to put them to sleep telepathically (138).

3. (U) Why are the Soviets again hard at work on the telepathic control of consciousness? Doctor I. Kogan, like Vasilev, is probably doing it for theoretical reasons; still trying mathematically to prove that an electromagnetic carrier of telepathy is possible. Why other scientists may be delving into control

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of consciousness by ESP is another question. During telepathic sleep is an individual simply dreaming his own private dreams or does someone else hold sway? The current Soviets have not divulged the psychological details about their telepathic manipulation of consciousness. Vasilev describes some revelations in his book (62) but little else has been reported. Doctor Stefan Manczarski of Poland predicts that this new field of telepathy will open up new avenues for spreading propaganda. He feels that the electromagnetic theory is valid and believes, therefore, that telepathy can be amplified like radio waves. Telepathy would then become a subtle new modus for the "influencers" of the world (139). Doctor Manczerski's wave ideas are still very debatable, but what about telepathy someday becoming a tool for influencing people?

4. (U) Hypnotizing someone telepathically probably comes over as a more eerie, mystifying, almost diabolical act in the US than it does in the Soviet Union. The US is really just becoming adjusted to some of the aspects of hypnotism. Since the turn of the century, the Soviets have been exploring and perfecting the various advantages that hypnotism provides. In the Soviet Union, hypnotism is a common tool like X-rays, used in medicine, psychotherapy, physiology, psychology, and experimental pedagogy.

5. (U) The Soviets have been reportedly working on the effects of drugs used in combination with psychic tests. Vasilev used mescarine in the early days and more recently M.S. Smirnov, of the Laboratory of Vision, Institute of Problems of Information Transmission of the USSR Academy of Science, has been obtaining psychic success with psilocybin (140).

6. (U) The tests that Vasilev had perfected may have a more interesting future in them than the developer had imagined. Manipulating someone else's consciousness with telepathy, guiding him in trance.....colorful uses are too easy to conjure. The ability to focus a mental whammy on an enemy through hypnotic telepathy has surely occurred to the Soviets. In espionage, one could telepathically hypnotize an individual with the post-hypnotic suggestion to steal classified documents or detonate important military equipment. The mission is accomplished and the individual does not even know that he has done anything. Ryzl (see appendix VI) stated in Psychic (141), "The bulk of recent telepathy research in the USSR is concerned with the transmission of behavior impulses - or research to subliminally control an individual's conduct." Visiting Soviet psi labs in 1967, Doctor Ryzl says

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he was told by a Soviet, "When suitable means of propaganda are cleverly used, it is possible to mold any man's conscience so that in the end he may misuse his abilities while remaining convinced that he is serving an honest purpose." (140) Ryzl continues, "The USSR has the means to keep the results of such research secret from the rest of the world and, as practical applications of these results become possible, there is no doubt that the Soviet Union will do so." What will ESP be used for? "To make money, and as a weapon," Ryzl states flatly.

SECTION II - CONDITIONING THROUGH SUGGESTION

PART A - Hypnopedia

1. (U) The subject of hypnopedia or sleep-learning has been openly discussed in the Soviet literature for the past decade (142-161). One of the most thorough Soviet reports has been prepared by Bliznichenko (162) in 1966. Dodge and Lamont (163) have published a report that covers the field of hypnopedia in the Soviet Union through 1968. Further elucidation of this subject in this report, with the exception of a discussion of possible trends in this area since 1969, is believed to be redundant and unnecessary.

2. (U) The last decade of Soviet hypnopedia research has led them into new concepts of memory improvement. It is believed that areas such as subliminal perception and subconscious learning with hypnosis were borne from the basic research involved in hypnopedia training. The most recent indication of new Soviet interest in utilizing the subconscious as a reserve for the retention of facts is a booklet written by L.I. Kuproyanovich (164). This book describes the equipment and technical means used for improving memory as well as the prospective uses of cybernetics for memory retention. One of the more interesting features of this book is a discussion on subliminal acquisition of facts. This is an area of concern when one is speaking of conditioned behavior or mental alteration. It is also an area seldom discussed in open Soviet literature. PART B of this section will briefly discuss some Soviet work in subliminal perception and possible uses for this technique.

3. (U) The following discussion on memory and hypnopedia is based on Kuproyanovich's report. The author states that the subconscious is one of the unused reserves for the retention of facts. Memory operation on the subconscious level takes place without our realizing

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it, and a man - without noticing it - has better retention or proceeds to a solution of a complex problem even when he does not specifically think of it, such as when he is out for a stroll. And, although information processing on the subconscious level is widely separated from the process that takes place in the conscious state, the transfer from the subconscious to the conscious is carried out instantaneously. This is why a solution or recollection occurs unexpectedly after the memory operates on the subconscious level. There is one other interesting property that is characteristic of the subconscious: the simultaneous processing of several parallel streams of information. This fact is extremely important, because when it occurs, there is a wider circle of associations and analogies that can become the stimuli and sources of new, unexpected recollections and decisions. And, finally, the subconscious operation of memory is more subject to the influence of emotions and feelings. Hypnopedia with automatic tracking (biological feedback as with the use of an electroencephalogram), in which - with the aid of the brains biocurrents - information transmission is carried out at the most favorable moment for retention and the sleep level is regulated by the biocurrents, is, in the opinion of the author more promising than the generally accepted methods of sleep learning. Experiments in instructing while in a semisleep state artifically induced in the daytime show good results. These methods have begun to be used both in the USSR and in non-US countries (Bulgaria, for example). Before each training session, a suggestion is received from the tape recorder that puts the student into a semi-sleeping state. After this, as in hypnopedia sessions, the information to be retained is given. The new method is as effective as hypnopedia, insofar as the quantity of information retained is concerned, but has the advantageous difference that it can be used in the daytime.

4. (U) Hypnosis is an effective means for improving perception and retention of information. However, hypnosis can be used only by people with medical training, and under certain conditions. The use of equipment that automatically induces and regulates hypnosis has made the problem of using it somewhat simpler. The most advantageous use of it will be made by an automatic device for hypnosis during the simultaneous instruction of a large number of students in hypnotic training classes specially created for this purpose. Some institutes in Japan and the United States are already instructing students under hypnosis according to Kuproyanovich.

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5. (U) The important feature of Soviet hypnopedia research is believed to be the conclusions that the Soviets are now arriving at in regards to the manipulation of the subconscious area of the brain. Much of the early work that is described by Dodge and Lamont (163) provide the foundation for a much broader understanding of the various methods available for conditioning the human mind. Hypnopedia research has produced an interest in the Soviet Union for the use of the psychology of memory and the subconscious in order to create conditions and functional states for improving memory operation. The areas that grew out of basic hypnopedic research include hypnosis, autogenic training and subliminal perception. It is believed that these newer areas of endeavor bear more scrutiny than the more mundane area of hypnopedia.

PART B - Subliminal Perception

1. (U) The use of subliminal perception in the advertising industry gained some notoriety in 1958 when an article appeared in the New York Times uncovering the technique developed by the New York firm known as the Subliminal Projection Company, Inc (165). Subliminal perception is a psychological belief that persons can be stimulated below (sub) the threshold (limen) of consciousness. Another interpretation, more commonly used, is that persons can supposedly be stimulated without being aware of it. Hypnopedia, for example, might be considered a form of subliminal perception.

2. (U) In the late 1950s there was much debate as to the moral and ethical use of subliminal advertising. There was in the US a strong moral repugnance to the use of subliminal perception in TV advertising. The furor raised by the public and the press concluded when the Federal Communications Commission entered the picture in 1957. An excellent overview on the subject of subliminal stimulation was prepared by McConnell et al in 1958 (166). The authors attempt to clarify the issues surrounding the application of subliminal perception. The article examines the levels of behavior that may be influenced by subliminal stimulation as well as the ethical questions that naturally arise. The article contains an extensive bibliography.

3. (U) The distinction between subliminal and supraliminal perception cannot always be clearly made. Because of the statistical nature of thresholds, it is possible that many subjects may receive some cues from stimuli even though they are supposedly below threshold. Also, what may for one person, at a particular

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time with a particular stimulus, be below threshold may for another person, or the same person in another situation, be above threshold. Insofar as subliminality is crucial for motivational or security reasons, stimuli of such low intensity may be required that little effect could be obtained. As one review of literature in this area concluded: "There does not appear to be substantial evidence for subception (subliminal perception) as a distinct phenomenon." (167) Another review of literature in this area (168) concluded that most effects that suggest discrimination without awareness can be attributed to imperfections in measurement techniques or other shortcomings of experimental methodology and cannot be clearly demonstrated to be related to perceptual variables. Other research in the communications field suggests that research on reactions to propaganda might more profitably focus upon other factors than upon intensity of stimulation.

4. (U) There is strong moral repugnance to the use of subliminal perception in propaganda. This was made evident a few years ago when some efforts were made (169) to introduce subliminal stimulation into TV as an advertising technique. Insofar as the US is trying to project abroad an image of itself as a nation encouraging individual freedom, it would seem extremely inappropriate to risk being detected employing propaganda techniques which appear to invade human privacy. It is highly doubtful that the American public would condone such use abroad, just as broadcasters have been reluctant to use this technique for fear of hostile reactions on the part of their audiences. While the risks of national public and international condemnation may be run for worthwhile objectives, if no great advantage accrues the risky approach would be inappropriate.

5. (U) The possibility of utilizing subliminal perception for military purposes may have been realized by the Soviets. As mentioned earlier, there is a distinct lack of open literature from the USSR dealing with this subject. However, there is mention of it in Kuproyanovich's recent book (164). The author states that the showing of movie films and slides, along with being an additional retention source, has yet another important value that aids in revealing the subconscious reserves of memory. Earlier in the author's text he describes the showing of movies where additional frames, of an advertising nature, were inserted between the film's basic frames. It was shown that, because of their brief but sufficiently frequent appearance, this technique acted on the subconscious (similar to US work in the 1950s). The Soviet

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technique, when it is necessary to strengthen memory or to create an emotion, utilizes supplemental frames at the rate of one per 25 basic frames. These supplemental frames, according to the Soviets, should contain explanations amplifying the memory of the basic film or creating some mood. Thus whether the movie watcher wishes it or not, the information filtering through his subconscious will create an overall background mood supplementing the basic one. According to Kuproyanovich, these films, which enlist both the conscious and subconscious memory functions, are very promising.

6. (U) According to a French expert in the field of electrosleep and electroanesthesia, the Soviets used a motion picture technique to interrogate prisoners (170). The French expert described the method as follows:

> "A movie film which shows what you want the individual to do is flashed on a screen at double the normal running speed. A speed of 24 frames per second was considered critical to the success of the method. While the movie is being shown, a 35mm slide projector is used to flash a written statement of what you want the person to do. The slide is interposed between each frame of the movie projection. The net effect of the operation is that neither the movie scene nor the slide can be read, but the subconscious picks up the information. As the individual becomes disorientated, he then responds to questions. Apparently there are no long term or residual effects as a result of the procedure. It was described as being particularly useful for interrogating hostile prisoners."

With the above description, Kuproyanovich's work and the Soviets knowledge in all areas of human behavior, it is not unlikely that they may be in a position to militarily threaten their enemies with sophisticated mind manipulation techniques in controlled situations or in the field.

PART C - Suggestology

1. (U) Suggestology is a new "ology" defined by the communist countries as the scientific study of suggestion. It is reported to be a method of reaching and making use of the unknown reserves,

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powers, and abilities of the human mind. In some areas it overlaps with parapsychology. One individual responsible for many of the claims for success in the field of suggestology is Doctor George Lozanov, head of the Institute of Suggestology and Parapsychology in Sofia, Bulgaria. Through extensive research he has discovered laws of suggestion which he has applied in many fields from medicine to education. The Bulgarian methods of suggestion are mentioned in this report because some of the theories have been adopted by the Soviets in their work on autosuggestion.

2. (U) Suggestology is not hypnosis. With this method of conditioning, the individual is always in the waking state. It has been reported that suggestology has been used successfully in medicine especially in functional disorders of the nervous system. The healing is based on the positive suggestion that nothing is wrong; it is a type of mind over body phenomenon. Sanatorium officials in Bulgaria testify that many patients are cured after a few sessions of positive thought patterning (171). Suggestology has been reported to be successful in replacing anesthetics in surgical cases as well as aiding the patient in decreasing his own blood flow. It is further claimed that with suggestology the incisions from surgical operations heal much faster than usual (172). The Bulgarians believe the technique of waking suggestion (not hypnosis) will continue to find a wider and very useful place in the practice of medicine (173).

3. (U) The possibility for upgrading the memorizing process and for accelerating the automation of habits, discovered through suggestological experimentation, offers possibilities for the development of a new science: suggestopedagogy (suggestopedy). The suggestopedic method of mastering a foreign language is not a variety of the current methods (audio-visual, audio-linguistic, conscious-practical, hypnopedic, etc.), but a qualitatively new training process in terms of its content, structure, and results. This method uses suggestion not as a means for some kind of mystical influence, not as some kind of abstract, "vague" factor, but as a specific method for directly influencing the emotional world and intellectual activities, the entire personality, of the student. Practical experience has revealed that a suggestion is not a sort of "third grade, marginal factor." Controlled and used purposefully, it creates conditions for upgrading considerably the capacity to memorize and to assimilate knowledge faster. In the training process usually suggestive methods are used spontaneously, intuitively.

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of pain and in the treatment of neuroses and other functional disturbances (177). Professor Svyadoshch believes that autosuggestion may be used with success in cosmonaut training. In his opinion, autosuggestion can be of great value to those whose occupation makes particularly great demands on self-control, in particular, space crews. Svyadoshch reports that it takes five or six months of special exercises to master the autosuggestion technique. This makes a person "immune" to fear, worry, and emotional instability (178).

6. (U) The Soviets have shown interest in the ability of humans to alter their psychophysiological state by autogenous and exogenous suggestion. A study was conducted to determine the possibility of changing the activity of individual organs and systems of the human body by autogenous and exogenous suggestion. Six test subjects were exposed to 70-day bed rest. Three of the subjects served as controls, and the other three were trained for the first ten days to arbitrarily strain or relax individual muscular groups, with subsequent sleep. Myotonometric data showed that different muscle tonus indices could be reduced 5-25%. ECG, EEG, myotonometric, and actographic data showed that sleep occurred by the 7 to 15th minute during the second to third weeks of the experiment. By the fourth week the test subjects were able to arbitrarily achieve a state of relaxation and sleep at any time, regardless of the emotional reaction background. At such times arterial pressure and pulse rate were significantly lowered. By the fifth week the test subjects attained similar results, although somewhat less effectively, by self-suggestion. Thus it is possible, by autogenous conditioning, for a subject to attain deep refreshing sleep at a scheduled time even with a background of different stress factors. Most effective changes in the psychophysical state occurred during direct contact of the test subject with the instructor, but exogenous suggestion was performed almost as well by means of a radio or tape-recorder (179).

7. (U) The possibility of being able to predict suggestibility in man prior to engaging him in long term trials has intrigued the Russians. E.F. Mordinov and A.A. Genkin (180) have shown that the electroencephalogram may serve as one of the objective quantitative measures of suggestibility in man in the wakeful state. Thirty-nine subjects in quiet wakefulness were subjected to two EEG parameters: (1) average level of asymmetry of oscillations and (2) average period of activity. Significant differences were reported in the average level of asymmetry of

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oscillations in the readily suggestible group (20 subjects) compared to the resistant group (19 subjects). Suggestibility difference effects existed in the hypnotic state and during wakefulness. The test of suggestibility was the classical one wherein the inability to unlock interlocked fingers of the two hands is suggested.

8. (U) The field of suggestion provides a further means for controlling or altering mental behavior. From the available Soviet literature it can not be determined to what extent it might be used for changing or manipulating behavior of their enemies. A possible application for US military forces is in the area of establishing defenses against hostile interrogation. The ability to control one's own emotions through autogenous suggestion might be most useful in PW situations. This, in turn, might provide the US with a clue as to why the Soviets seem so interested in the field of suggestion. On the other hand, the Soviets may have the ability to directly influence the emotional and intellectual activity of a prisoner, without his knowledge, by using Lozanov's techniques employing subtle conditions of seemingly relaxing and unmolesting environments.

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PART IV

PROPAGANDA AND MASS MEDIA

1. (U) It is difficult, if not impossible, to assess the Soviet's potential for controlling or manipulating the behavior of their enemies through the use of propaganda. One can survey the Western literature and be able to make some rational judgments on the effects of mass media, for example, on the mental behavior of its audiences. Walter Weiss of Hunter College in New York has published an excellent study (181) on the relationships between mass media of communication and social change. The author also reports on the roles of the mass media in the development of modernized countries. In another report (182), Weiss surveys the significant literature on the mass media from January 1967-December 1969. Unfortunately these surveys deal primarily with the free world.

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pursuant to 5 USC 552(b) (1).

3. (U) A report prepared by Goure (183) further depicts the emphasis that Soviet authorities place on propaganda. The report relates the all out effort that Soviet authorities are using in order to indoctrinate their own people on the importance of civil defense. Included in their attempts to create fear of nuclear, chemical, and biological attack are direct assaults on the US. This certainly represents a method of behavior change or control. In an effort to propagandize civil defense in the Soviet Union intensive use is being made of all media of mass communication: the press, television, radio, movies, exhibits, and lectures. Pamphlets and books are published and disseminated on a wide scale. All the national and major provincial newspapers, including Pravda, Izvestiya, and Red Star, have published articles on civil defense, often by prominent party or government officials (184). The basic pamphlet for the instruction of the general public, Everyone Should Know This, first published in 1968 has been issued to most families. The following are a few select examples of the intensity and scope of Soviet civil defense propaganda activities: In 1969, the Belorussian SSR local newspapers printed 1,200

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articles on civil defense, one district (rayon) alone publishing 700 of them, and there were 45 television broadcasts and over 1,000 radio talks and reports on civil defense (185,186). In Novosibirsk, 2,000 lectures were given on civil defense subjects by the "Znaniya" (Knowledge) Society (187). In the Georgian SSR over 7,000 propagandists of the Ministry of Culture are promoting information on civil defense (188). Forty civil defense movies are being shown throughout the country in regular movie theaters and in various clubs, which were said to have been seen in 1969 by about 90 million persons (185). In the town of Orel, one city district alone had 179 civil defense exhibits (189). In the Azerbaidzhan SSR, in one month there were nine television broadcasts and 300 items in the local press dealing with civil defense, while in a district in Belorussia in one month there were held 120 public lecture sessions, 75 showings of civil defense movies and numerous broadcasts (190,186). Many factories broadcast weekly or biweekly talks on civil defense over their public address systems. Soviet civil defense authorities also have tried to expand civil defense propaganda by bringing to it writers, journalists, painters, movie producers and other persons from the creative arts. As part of this effort, arrangements were made with the Union of Writers to send groups of their members to attend two-week seminars at the Higher Central Officer Course on Civil Defense of the USSR. Meetings and conferences of writers and other artists with civil defense officials were also held in a number of the major cities (191,192). Soviet civil defense leaders argue that the population must be well prepared in a morale-psychological sense if it is to withstand the shock of a nuclear war and its aftermath. Consequently, in addition to reassuring the population about the effectiveness of civil defense measures and the strength of the Soviet Armed Forces, the propaganda and training programs are also used to instill in the population "hatred for the enemies." It is noted that:

> A rise in the importance of indoctrinating hatred of the imperialist aggressors is also due to the objective pattern of a further rise in the role of morale in modern war (193).

This is accomplished by stressing the alleged US plans to attack the Soviet Union and other "peace-loving" peoples. It is noted with some satisfaction that Soviet soldiers "like all honest people in the world, detest Americans and all other imperialists." The literature emphasizes the importance of teaching the youth

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to hate all enemies of the Soviet Union, since unlike its elders it has not passed through the harsh experience of revolution and war. This indoctrination, of course, also serves the political purposes of the Soviet leadership and tends to facilitate its control over the population. In this respect the civil defense program contributes to strengthening the Soviet citizen's loyalty to the leaders and the Communist system.

4. (U) It is evident from the information provided above and in Appendix V that the Soviet Union has a well polished and sophisticated system of utilizing propaganda and the mass medium for its own advantage. It is thought to be very possible that with the knowledge gained in utilizing their system on their own people, and other communist countries, this system of control could be unleashed on military forces confronting Soviet or allied Soviet units.

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PART V

PSYCHOPHARMACOLOGY IN THE USSR

SECTION I - GENERAL

1. (U) Since ancient times, men have been aware of the fact that plant and animal products can induce desirable or undesirable psychological effects. For example, a primitive faith in the psychological effects of drugs is evident in the continued use of philters and potions to induce love and hate. Hippocrates proclaimed that the brain was the organ of the mind, a view still not held by those of dualistic persuasion.

2. (U) Before the twentieth century, when little was known about the pathophysiology of somatic disease and even less about mental disease, remedies were largely effective on a psychological basis. However, substances long known to have true psychopharmacological actions were opium and wine. These were employed not only to treat disease but also to make life more bearable. During the nineteenth century, the development of the science of chemistry made possible the discovery of agents with relatively selective effects upon the central nervous system. The nineteenth century saw the development of nitrous oxide, diethyl ether, sedatives, and hypnotics. However, until the mid-1950s there was little real progress in clinical psychopharmacology. The development of the phenothiazine drugs in the 1950s saw the augmentation of synthetic agents for therapy in psychotic disorders. The phenothiazines as a class, and especially chlorpromazine (Thorazine), are among the most widely used drugs in the practice of medicine today. From 1955 to 1965 at least 50 million patients received chlorpromazine and more than 10,000 publications have dealt with its actions (195).

3. (U) The use of psychopharmacologic agents is of keen interest throughout the world including the Soviet Union. Investigations on psychotherapeutic agents can no longer be overlooked in the Soviet literature. In the pharmaco-therapeutic reference work by Aronovich (196), four phenothiazines - aminazine (chlorpromazine), propazine, dinezin, and mepazine - and also reserpine (serpasil) are listed: but reports of clinical experience with phenothiazines (Rauwolfia derivatives play a smaller role altogether) refer almost exclusively to aminazine (approximately 127 references available-USSR). Most of the aminazine studies follow standard clinical research techniques however, some uses as mentioned in PART I of this report appear to be for more sinister purposes. Based

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on the wealth of Soviet literature, the popularity, for whatever reasons, of aminazine therapy in the Soviet Union cannot be disputed. (114 references available on psychopharmacology-USSR).

SECTION II - MAIN PSYCHOTROPIC SUBSTANCES - USSR

1. (U) According to Guseynov (197), modern Soviet medicine is devoting special attention to the development of psychopharmacology. At the present time (1971), Soviet scientists are conducting intensive investigative work on the study and introduction into medical practice of new psychotropic substances. The most important Soviet psychotropic agents are as follows:

(1) Diethylamide lysergic acid -- LSD-25
Disrupts the psyche, causes hallucinations, but consciousness is maintained. Used to diagnose schizophrenia, and also to create a model of psychosis in animals.

(2) Mescaline -- Mescalinum
Under its influence a dimming of consciousness takes place, and hallucinations and psychosis develop. Used to diagnose certain mental illnesses and to create a model of experimental psychosis.

(3) Harmine -- Harminum
Calms the central nervous system, disrupts the psyche, causes hallucinations, eliminates spasms. Used in parkinsonism. Prescribed for internal use.

(4) Indian cannabis
The active ingredient is a tar used under various names -- hashish, marijuana, bhang, dagga, and others. This tar is smoked, chewed, and added to food and drink as a stupefacient. Cannabis disrupts the psyche, causes hallucinations and euphoria, and subsequently psychoses and schizophrenia develop. It has no medicinal significance.

(5) Iprazide -- Iprazidum (Marsilid)
Stimulates the mental sphere, eliminates states of depression. The effect comes on gradually over 12 to 16 hours and lasts 7 days. It is used for schizophrenia, psychoses, states of depression, and hypertonia.

(6) Imizine -- (Tofranil)
Has a thymoleptic effect, eliminates states of depression. Used in cyclophrenia and other mental disorders. Prescribed for internal use or is introduced intramuscularly.

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(7) Transamine — (Parnate)

By blocking the enzyme monoaminoxidase (MAO), it increases the content of biogenic amines in the brain and by so doing eliminates states of depression. Used for mental disorders accompanied by severe depression. Prescribed for internal use.

(8) Phenamine — (Benzedrine)

Sharply stimulates the central and sympathetic nervous systems. Increases blood pressure, dilates the pupils, quickens pulse, relieves fatigue and somnolence. Perception is facilitated in people who have taken phenamine, thinking and memory are improved, motor activity and speech are increased, and mental and physical efficiency are improved. Used in narcolepsy, alcoholic psychoses, psychogenic depression, and poisonings by narcotics and somnifacients. Prescribed for internal use.

(9) Phenatine -- (Nicotinamide)

Stimulates the central nervous system; in contrast to phenamine, it does not increase, but rather lowers blood pressure. Used for mental and physical fatigue, and also for hypertonia. Prescribed for internal use and is introduced subcutaneously.

(10) Piridrol -- (Meratran)

Intensifies higher nervous activity, eliminates states of depression. Used in narcolepsy and psychoses accompanied by depression and apathy. Prescribed for internal use.

(11) Meridil -- (Ritalin)

Stimulates the central nervous system, eliminates states of depression. Used in psychoses and states of depression. Prescribed for internal use.

(12) Aminazine -- (Chlorpromazine)

Calms the central nervous system, lowers blood pressure and body temperature, halts vomiting, slows down pulse, eliminates the effect of histamine. Successfully used in schizophrenia, psychoses, neuroses, delirium tremens, and hypertonia, toxicoses of pregnancy, dermatoses, and in surgery to create artificial hypothermy. Prescribed for internal use or introduced intramuscularly.

(13) Meprotan -- (Equanil)

Eliminates internal anxieties and feelings of fear and alarm, calms the central nervous system. Used in physchoses, neuroses, epilepsy, insomnia, and moderate hypertonia. Prescribed for internal use.

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(14) Amizil -- (Diazil)

Calms the nervous system, eliminates spasms and the effect of histamine, restores disrupted pulse. Used in psychoses, neuroses, and states of depression and phobia. Prescribed for internal use.

(15) Reserpine -- (Serpasil)

Main alkaloid of the plant Rauwolfia serpentina. Calms the central nervous system, eliminates feelings of fear, longing, and alarm, lowers blood pressure, and slows down pulse. Widely used in schizophrenia, psychoses, neuroses, hypertonia, tachycardia, thyrotoxicoses, and others. Prescribed for internal use or introduced intramuscularly.

SECTION III - PSYCHO-WARFARE AGENTS

PART A - Diethylamide Lysergic Acid (LSD) and Psilocybin

1. (U) Psycho-warfare agents may be defined as those chemical warfare agents whose effects rest on changes of the psyche (198). These materials have the advantage over other warfare agents in that the efficiency of the victim is impaired even with minimal doses. Ordinary methods applicable in combat cannot afford detection of these agents, and for this reason warning cannot be sent out in time when these psychotropic poisons are used. Only the abnormal behavior of the victim may afford the first indication that such compounds have been given. In effective concentrations, these agents are odorless and tasteless and they can be utilized both on the battlefield and in sabotage for contamination of drinking water and food. For this reason the military medical team needs to inform themselves on the effect of these weapons and their symptoms.

2. (U) Lysergic acid diethylamide (LSD) is almost a "classic" representative of psycho-warfare agents. A. Hofmann synthesized this compound in the course of his investigations on the composition of the ergot alkaloids. Even minimal amounts of this substance, about 30 to 60 micrograms, are evidenced by psychological-emotional changes in man, which may last from six to eight hours. There is an association of motor uncertainty, unsure and swaggering walk, poor prehension and dragging speech with vivid color hallucinations, disturbances of spatial and temporal sense, attacks of crying and laughing, fear and delusions and sometimes severe phenomena of depersonalization. The behavior of the victim is comparable to that of the schizophrenic. LSD is effective in doses that are one-ten thousandth of mescaline doses, and it is much more readily handled in the form of easily water-soluble tartrate. After the

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LSD psychosis wears off, the victim experiences no after effects, however it has been reported that part of the hallucinations are subject to recall and flashback reactions have occurred. Psilocybin exerts a qualitatively similar effect in man, but about 100 times weaker than LSD. This material is known as the psychotropic subtance of the Mexican magic mushroom (Psilocybe mex. Heim). The more effective compound is psilozine which occurs in the organism through dephosphorylation of psilocybin. As shown by animal experiment, just 20 minutes after i.p. injection of psilocybin, dephosphorylation is observed, indicating a rather high content of psilozine in brain and other organs of the animals. The two substances are identical with respect to their psychotropic effect, and at the start of the psychosis there are changes in physical feelings (weakness, dizziness) as predominant symptoms. Only later do the optical and acoustic hallucinations start. Anxiety, restlessness, nausea and difficulty in speech are characteristic of the further symptoms of intoxication. In the later course of the psychosis there is extensive loss of ability to concentrate or think, and there is also loss of sense of space and time. After the psychosis wears off the victim complains of exhaustion, fatigue and headache, but these symptoms disappear after a while. LSD, psilozine and psilocybin are biochemically correlated to serotonin. It is not yet clear to what extent this correlation is based in enzyme chemistry. However, similar structures in the molecules of these substances suggest pharmacodynamic interpretations. Since brain function is closely related to serotonin metabolism it can be assumed that this substance is replaced by structurally very similar psychotoxins that are built up, namely by substances of the tryptamine group, e.g., LSD. These poisons do not take over the functions of the serotonin, however, and this leads to disturbances in the CNS. The comparison of the above named materials with other tryptamine derivatives such as dimethyltryptamine and bufotenine, which is an isomer of psilozine, also fits into the framework of pharmacodynamic interpretation. Both derivatives are psychotropically active substances, effective in man in doses of about 70 mg.

3. (U) Several institutes in the Soviet Union have been identified where LSD research has taken place since 1969. The Institute of Physiology in Tbilisi was reported to be doing work on the effects of LSD on baboon behavior. No specific experimental work is known (199). A group at the Institute of Molecular Biology, Academy of Sciences, Moscow, has been working with LSD in experiments with inhibitors (200). It is difficult to judge what the Soviets are doing, but the work with inhibitors might indicate research efforts in the area of medical defense against the use

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of LSD on Soviet troops. There is a group at the Institute of Physiology in Novosibirsk. No details on their work is available. The relationship between LSD, serotonin, and motor components of behavior reactions is being studied at the Donetsk Medical Institute (201). The Soviet research in the area concerned with the action of bioamines, e.g., adrenaline, serotonin, and noradrenaline, which the Donetsk group is studying, will be discussed later in this report. Studies concerned with the reversibility of pathomorphological changes in the brain of rats after chronic administration of LSD were going on in 1971 at the Moscow Medical Stomatological Institute (202). The First Medical Institute imeni I.M. Sechenov has reported their work on the search for antagonists for hashish and LSD (203). Kudrin reported that Haloperidol (a butyrophenone tranquilizer) injection in combination with Phenitron (a propiophenone adrenolytic) prevents cats from the development of LSD-induced psychosis and catatonia. This is an important aspect of Soviet LSD research as it indicates their possible interest in military medical defense against psychowarfare agents. Popova has reported on the effect of LSD on the structure of neurons and interneuronal connections. The author states that her observations suggest that the central effects of LSD may be related to changes both in synapses and in the cell body (204).

4. (U) This study has attempted to establish the possibility that the Serbsky Institute of Forensic Psychiatry in Moscow may be one of the main Soviet facilities for studying controlled offensive behavior (see PART I). I.P. Anokhina of the Serbsky Institute reported in 1970 on the effect of LSD on the neurotransmitter systems of the brain. The experiments brought evidence that the site of action of LSD is in the midbrain reticular formation and in the limbic system. Anokhina also believes that LSD inhibits monoamineoxidase (MAO) activity (205). The experiment reported in the open literature is scientifically genuine, of course, but the important fact is that the Institute is studying LSD and other psychotropic agents. Since most of the Soviet LSD literature is from institutes in Moscow, it might be conjectured that there is a concentrated effort in the USSR to determine the basis of action and uses for LSD and other possible psychowarfare agents.

5. (U) Until March of 1968, there were three chemical plants located in Czechoslovakia conducting independent research on CW compounds. As late as March 1968, they were working on super-active compounds based on materials such as LSD and mescaline.

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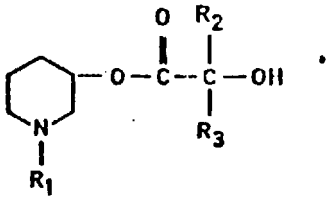
At that time, the work was supported by the Soviet Union but conducted by the Czechs, with the final product going into Czechoslovakian stockpile. The Soviets furnished formulas, specifications, production guidance, test procedures, and animal data. They may have also provided some precursor chemicals. The Czechs were working on aerosols as one method of applying the gaseous materials developed from this program. It is stated that LSD experiments had been disappointing but that other materials similar to LSD had been quite successful. The compounds were being developed to be dispersed over a wide area from the air. The agents were designed to make the population lose its will to resist for anywhere from two hours to two days, depending on the compound used and the nature of the mission. Damage would be limited to the brain (206).

PART B - Piperidyl Benzilate and Piperidyl Glycolate

1. (U) In the course of the search for anticholinergic substances, it was found that methylpiperidyl benzilate and its derivatives are extremely active hallucinogens. If we start from the general formula for piperidyl benzilate and piperidyl glycolate, a series of highly active psychotropic compounds can be derived from it. The radicals of the formula below are involved as substituents. From the piperidyl benzilate series we can mention N-methylpiperidyl benzilate as a highly active psychotoxin (R_1=CH_3; R_2 and R_3=C_6H_5). From the piperidyl glycolate series, Ditran (R_1= -C_2H_5; R_2= -C_6H_5; R_3= -C_5H_9) can be described as an extremely active compound.



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2. (U) Poisoning with piperidyl glycolates is hardly to be distinguished from LSD poisoning at the beginning, because also in the first mentioned class of materials the first psychic effects occur after 45 to 60 minutes. They consist of confusion, speech difficulty, disorientation and hallucination of optical and acoustic type. It is to be noted that in piperidyl glycolate psychosis the victim can still describe his condition relatively clearly after a dose of 0.5 to 2.0 mg. At doses of 10 mg and above, however, contact with the environment and insight into the artificiality of the condition is lost. The victims react only to their hallucinations, or they present a stupor syndrome. At still higher doses (15 mg) there is generally a severe disturbance of consciousness with almost complete lack of consciousness. The effect of Ditran, for example, lasts for about 24 hours, and sometimes as long as 36 hours. Other toxic phenomena are not to be anticipated at the indicated doses, -- at the most nausea and emesis.

PART C - Countermeasures

1. (U) In the use of psychotropic warfare agents, the enemy sets himself the task of weakening the will and fighting capability of the opponent, or to bring about his complete inability to act or fight. For this reason, only well-timed application of protective equipment and measures for guaranteeing indubitably uncontaminated drinking water and food can afford flawless protection. This condition in this case has so much the greater significance because a timed alarm is questionable in dealing with psychotropic agents. Certain medicaments are available to the physician for the treatment of those already poisoned to offset the worst effects. As antidotes there are:

(1) Azacyclonol (Frenquel) in an i.v. or oral dose of 200 mg
(2) Succinic acid, infusion in a 5% phosphate buffered solution (5ml/min)
(3) Tetrahydroaminacrin, 30 mg i.v. within 5 minutes
(4) Chlorpromazine (Thorazine) 25 mg i.m. or orally larger doses

2. (U) The medicaments under one and two are indicated in poisoning with LSD, psilozine and psilocybin. The medicament under three is to be given in poisoning with piperidyl benzilate or piperidyl glycolate. Chlorpromazine has a favorable effect on most model psychoses induced by known psychotropic warfare agents.

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SECTION IV - CURRENT RESEARCH INTEREST IN PSYCHOPHARMACOLOGY - USSR

PART A - Bioamine Research

1. (U) Space in this report limits this discussion on bioamine research. There is a vast quantity of literature available on bioamine research, e.g., serotonin, dopamine, adrenalin, and noradrenalin.

2. (U) Discarding some elements of sensationalism, academician P.K. Anokhin (relationship to I.P. Anokina unknown; see reference 205) maintains that today's knowledge of the human brain gives grounds to believe that in the next decade some artificial means will be found to influence the intellectual capacities of man (207). Doctor Anokhin is with the Institute of Normal and Pathological Physiology in Moscow (208).

3. (U) A small group of little-known amines, commonly referred to as the biogenic amines, seemed to provide links between behavior and such fields of brain research as neuroanatomy, neurochemistry, and neurophysiology. It seemed possible that advances in the neurochemistry of these amines would greatly enrich one's knowledge of a variety of processes related to brain and mind. This has indeed happened. Although the surface has still barely been scratched, research in the interim has broadened the ideas concerning such phenomena as mood, sleep, sexual desires, and appetite -- and such neurological disorders as parkinsonism and chorea. Moreover, the whole field of psychopharmacology has become rationalized as relationships between the major psychoactive drugs and amine action have been revealed.

4. (U) It has now been established beyond reasonable doubt that communication between neurons in the mammalian nervous system is by means of chemical agents, or neurotransmitters, which are released from the nerve terminal of one neuron and which cross the synaptic cleft, or interneuronal space, to influence the excitability of the next neuron. The alternative possibility of electrical transmission has been ruled out. The existence of these chemical messengers provides a possible way of influencing behavior and mental performance while leaving other aspects of brain function almost completely unaffected. If the transmitters governing the cells associated with such functions as sex, appetite, sleep, or mood turn out to be specific and if chemical methods can be found for selectively interfering with their metabolism, then fairly

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precise behavioral modifications might be brought about. Unfortunately, the identity of neurotransmitters associated with most cells is unknown. However, a few neurotransmitters have been identified, and an exciting flood of research has always accompanied their discovery. Bridges are built between the often separated fields of pharmacology, physiology, and biochemistry, and a new level of understanding of the nervous system is achieved. So it was when acetylcholine and noradrenaline were found many years ago to be the transmitter substances for the parasympathetic and sympathetic parts of the autonomic nervous system. And so it has been in the past few years as evidence has built up in favor of dopamine, noradrenaline, serotonin, and acetylcholine playing neurotransmitter roles in the visceral brain.

5. (U) Two groups of workers have recently reported that cholinomimetic stimulation of the brain produces aggressive behavior and killing in rats. Cholinergic blocking agents reverse the effect. The areas involved are the lateral hypothalamus (Smith, King, and Hoebel 1970), septal area and amygdala (Igic, Stern, and Basagic 1970). Pathological aggressiveness is probably the most disagreeable of all human traits. The precise identification of circuits of violence and a definition of their means of control would be of inestimable social value. That pathologically agressive behavior can be triggered without discernible provocation in susceptible individuals is as well known to the courts as it is to the medical profession (209).

6. (U) The discussion above was included as important background information on the brain, biogenic amines and theories for controlling behavior. The author mentions that the precise identification of the mental pathways for aggression in humans would be of inestimable social value. However, if one does learn and identify these pathways and ways of initiating aggressive behavior as in the rat experiment above, it may be used for antisocial effects as well.

7. (U) A.R. Luria of the University of Moscow has been studying the functional organization of the brain for several years. In a recent article, Doctor Luria describes some recent Soviet advances in the mapping of the brain (210). The lengthy article is concluded by Luria stating that neuropsychology has put us (the Soviets) on a new path in the investigation of how the brain functions. Luria feels that this is likely to lead the way to substantial changes in the design of psychological research in the future.

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8. (U) An interesting research report in 1968 appeared in the Soviet press which related biogenic amines with psychotropic drugs (211). The type of mental disturbance produced by psychopharmaceuticals was investigated in human volunteers. The volunteers received a variety of compounds (not named) in 20—150 mg doses. Psychic disturbances were of two types: anxiety depressive and deep depressive. The first group reported more phobias, while the second group exhibited general lassitude, and hypochondriac symptoms. Adrenalin and noradrenalin were given by injection. DOPA and serotonin were also given. Creatine levels in the urine were determined after treatment. Other metabolites were detected chromatographically or by paper electrophoresis. Before treatment, group I patients excreted higher than normal levels of creatines, their metabolites and precursors. In the second group, excretion of catecholamines, precursors and metabolites was higher (up to 2 times) than in the controls. The administration of tranquilizers (Librium) accompanied the reduction in excretion of abnormal metabolites. This study is important because it illustrates Soviet interest in not only biogenic amines, but also in the mode of action of psychotropic substances. Once the parameters are understood, then the development of highly sophisticated mood altering chemicals should follow.

9. (U) Of interest was the symposium on Mechanisms of Regulation of the Biogenic Amines Level in the Tissues held in Lodz, Poland in August of 1971. No data is available but the abstracts of the papers is to be published in Acta Medica Polonica in April of 1972. The main aim of the symposium was for the comparison of data on the mechanisms of regulation of the biogenic amines level in the tissues with special emphasis on the role of enzymes responsible for synthesis, catalysis, and storage of amines.

10. (U) The relationship of psychoactive drugs to amine activity is shown in Table IV below.

TABLE IV

Relation of Psychoactive Drugs to Amine Activity (209)

A. Drugs which impair amine synaptic activity

1. Tranquilizers
   a. Inhibitors of vesicle binding: rauwolfia alkaloids--e.g. reserpine
   b. Blockers of receptor sites: phenothiazines, butyrophenones--e.g. chlorpromazine and haloperidol

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2. Amine synthesis inhibitors
   a. Inhibitors of catecholamine synthesis: e.g. alpha-methyl-p-tyrosine
   b. Inhibitors of serotonin synthesis: e.g. p-chlorophenylalanine

B. Drugs which enhance amine synaptic activity

1. Psychic energizers
   a. Inhibitors of monoamine oxidase: hydrazines and monoamine analogs--e.g. iproniazide, tranylcypromine, amphetamine
   b. Inhibitors of amine uptake: dibenzazepines and miscellaneous derivatives--e.g. imipramine, amitriptyline, cocaine, amphetamine
   c. Amine releasers: amine analogs—e.g. amphetamine, tyramine

2. Amine synthesis stimulators
   a. For dopamine and noradrenaline: L-dopa
   b. For noradrenaline: L-dihydroxyphenylserine
   c. For serotonin: L-5-hydroxytryptophan

PART B - Other Areas of Soviet Research in Psychopharmacology

1. (U) Barkov and Gurovich (212) reported on the effects of tripthazine (stelazine) and aminazine (thorazine) on emotional behavior. The compounds were found to inhibit aggression but prolong the fear reaction in rats.

2. (U) The Soviets have conducted experiments which use an automatic, multichannel register of motor activity. The instrument independently records all the movements of the animals located in a special chamber and transmits the signal to 40 counters. Kruglov is using a modern radio-electronic device which can record the signals, of milli-second duration, by which neurons transmit information to each other. Kruglov and his colleagues have established that morphine, aminazine, and similar substances inhibit the signaling rhythm of nerve cells. These experiments yielded many new tranquilizers and stimulants. None of these "new" substances were described. The Soviets claim that neurotropic drugs are now making it possible to intervene in the most important processes taking place in the organism. No description of what important processes taking place is mentioned (213).

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3. (U) Controlling group behavior with drugs has been reported by I.P. Lapin (214). The study dealt with animals but may have some bearing on human behavior reorientation. According to Lapin, in order to change the behavior of a large group of animals, it is sufficient to use drugs to control the behavior of the most active animals (leaders). The article discusses the use of amphetamines and aminazine. Further reference to Lapin can be found in an article of 23 September 1968 (215).

4. (U) One of the most interesting areas of research into finding new psychotropic substances may be associated with the gonionemous jellyfish. Research into the nervous and pychic disorders resulting from lesions caused by the jellyfish has been reported by the aforementioned Serbsky Institute (216). It appears that literature on Soviet research in this field is extremely limited. Mikhalev and Vatskov studied 260 cases of lesions by poisonous gonionemous jellyfish. General and local disturbances are distinguished according to their severity and symptoms of intoxication in the clinical picture. In cases of a severe course of the affection (18 patients), except for polymorphic somatic symptoms, there were distinct neuropsychiatric deviations. They were expressed in tormenting headaches, convulsions, paresis, disturbances of statics, sacral posterior radicular pains. Vegetative symptoms were in the form of hyperhydrosis, acrocyanosis, hypersalivation, and red demographism. Mental disturbances proceeded with an increasing fear of death, sometimes with speech and fugiform excitation, altered consciousness of the delirio-amentive or oneiroid type with illusions, hallucinations, psychosenory and delusional symptoms. The psychotic symptoms of an acute exogenous reaction subsided during the following two to five days. This research might have significance in the Soviets attempts to arrive at suitable means for controlling or altering behavior.

5. (U) A noteworthy book from Czechoslovakia that discusses some of the present problems of some militarily important psychoactive substances has been published (217). The book discusses the history of natural psychotomimetics used in religious rituals. There are mentioned two possibilities for the application of presently known psychoactive drugs for the purpose of military gain:

a. Controlling stress situations in special military units in combat to include means for treating mass psychoses in extraordinary situations.

b. The use of temporary incapacitating agents for disrupting and capturing enemy personnel.

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The problems associated with military misuse of drugs is discussed. The classification of psychotomimetic drugs relating to their effects, either on higher nervous activity or in producing temporary disorders, mainly in somatic functions is outlined. The authors also mention some characteristics of the piperidyl glycolate group of psycho-warfare agents. Structural analogy of psychotomimetic derivates to the particular neurotransmitters is considered together with a hypothesis of competitive antagonism on receptors. The authors state that competitive antagonism seems to be one of the most acceptable possibilities of hallucinogenic effect mechanisms as well as a good base for the investigation of potential means for the effective prevention and treatment of hallucinogen intoxications. The influence of stress and conventional weapons on the eventual result of pschotomimetic drugs effect in exceptional situations is taken into account.

6. It must be concluded, based on the Soviet literature on psychopharmacological research, that the USSR has the ability and knowledge to develop and produce a sophisticated arsenal of incapacitating or mind altering weapons in the form of chemical agents.

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PART VI

LIGHT AND COLOR AS A MEANS OF ALTERING HUMAN BEHAVIOR

SECTION I - PSYCHO-OPTICS

PART A - Background

1. (U) According to Dodge (218), there have been persistent reports of unusual flashing or bright lights emanating from Soviet naval vessels and long range aircraft (BEAR, BADGER, BISON). Such activities have coincided with US and NATO surveillance operations conducted from interceptor aircraft and naval vessels. In some cases, surveillance personnel have been temporarily blinded and disoriented by various intensities and colors of continuous or intermittently flashing lights during nocturnal missions.

2. (U) Dodge further relates that in 1968, a night watch officer aboard the HMS Valiant was temporarily blinded by what appeared to be a bright blue light situated slightly below the mast of a KOTLIN destroyer. When his night vision recovered, he reported perceiving red lights which appeared to be situated above and behind the blue light. Both sources of light appeared to be portable. In 1970, an aircraft was tracked by a spotlight trained from a Soviet naval vessel. Several pinpoint bursts of amber and amber-green light were noted aft of the spotlight and shined in concert with it.

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4. (U) Again in 1968, another F-102 pilot reported that a steady brilliant white light was shined from a hand-held aldis-type lantern situated in the tail blister of a BEAR B aircraft. In late 1968, still another F-102 pilot reported a blinding light in concert with a pulsating (1.5 flashes/second) red strobe light from a BEAR aircraft. In 1970, an F-102 pilot reported that a BEAR C aircraft shined a hand-held light of brilliant intensity from its left rear tail blister. The light was trained on the pilot from 15 to 20 times with a flash duration of two to seven seconds (218).

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5. (U) A report that appeared in 1971 discusses some US air personnel problems when encountering Soviet aircraft over the Mediterranean Sea (220). "By far, the most dangerous encounters occur after dark. For safety's sake, both the BADGERS and the PHANTOMS usually turn on their navigation lights (which they would never do in a combat situation), but sometimes the Russians come in blacked out, or shine searchlights in the eyes of the PHANTOM pilots - causing a temporary loss of night vision - or trickily switch their navigation lights on and off."

6. (U) Some of the nocturnal incidents described above suggest that the Soviets have not overlooked the possibility of utilizing bright and flashing lights as a means of altering behavior. It is interesting to note that the period of active research in Soviet laboratories, as will be discussed in PART B below, coincides with the reports of their employment of unusual flashing lights against US and NATO personnel.

PART B - Soviet Research in Photic-Flicker

1. (U) A series of conclusions were drawn on the effects of flicker at a symposium held in the US in 1957 (221). Although the meeting and papers presented are fifteen years old, the facts presented appear to be relevant to this discussion. The conclusions reached by the group at Tulane were as follows:

(1) There appears to be general agreement that flicker has the potentiality of causing considerable interruption of the normal functions of the human nervous system.

(2) One manifestation of such interruption may take the form of sleep, unconsciousness, hypnotic states, or other forms of interference with consciousness. Another manifestation of interference consists of annoying or irritating sensations such as queasiness, discomfort referable to the eyeball and caused by excessive pupillomotor activity, headaches, or general sensations of apprehension. A third type of manifestation concerns visual illusions including color sensations, patterns of movement and development of odd shapes. These may interfere with visual recognition of any objects which actually are in the visual field.

(3) Those flicker effects which interfere with consciousness appear at frequencies related to the alpha rhythm of the EEG, or at 10 Hz. Annoying or irritating sensations seem to occur with aperiodic flashes or with rhythmic flashes at 3-5 Hz. Visual illusions appear to be produced by frequencies above 10-12 Hz.

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(4) The EEG appears to be a reliable indicator of consciousness but not of sleep or wakefulness...

(5) Not every subject shows truly periodic EEG activity...

(6) Photic driving of the EEG by periodic flicker is a well known phenomenon although many subjects do not show the effect...

(7) The ease with which photic driving can be produced has not yet been correlated with emotional patterns or with sleep-wakefulness cycles. However, the visual illusions which result from flicker may be the basis for a highly predictable method of measuring anxiety.

(8) The production of flicker effects is not limited by the retina but appears to be limited by some process in the central nervous system which converts discontinuous activity to continuous activity (i.e. flicker to fusion)...

(9) Flickering of other sensory modalities may influence the ease of production of the desired effects of visual flicker. Auditory flicker is particularly promising in this regard.

(10) Stress, comparable to that produced in actual combat, may be needed to completely elucidate the practical effects of flicker as far as military applications are concerned.

(11) It appears likely that high intensities of light will be more effective in producing the desired effects of flicker although much remains to be done to determine the optimum light and dark intervals, background contrasts, and effects of stray light.

As will be depicted later, the areas above where no definite conclusions were drawn (4,7, and 10) is the exact area of high Soviet interest. L.I. Kuproyanovich (164) describes in some detail Soviet efforts in relating EEG with sleep and memory as well as the areas of photic drive and the synchronization of flicker frequency and alpha wave rhythm. At the University of Leningrad work has been done on the effects of strobe lights flashing at a different rate for each eye. One rhythm for the left eye and another for the right eye brings on measurable brain wave patterns. Lights flickering at different rates on each eye cause a sensation of rotation and a very unpleasant feeling in the viewer. It might be mentioned that the Soviets are thinking of using the "seasickness" application of flashing lights in a telepathic mode (222).

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2. (U) The most recent conference on flashing lights was held during the period of 19 through 22 April 1971 in London. It was the "International Symposium on the Perception and Application of Flashing Lights." From the sources available, it has been determined that no Soviet or East European personnel attended; further, no one at the conference discussed the possible use of flashing lights for military purposes (223).

3. (U) Among the varied research interests in the Soviet Union dealing with flashing lights is the relationship of the vestibular to the visual systems. Electrophysiological data on the effect of the vestibular apparatus on the optical system has been published in the Soviet Union (224,225). It has been reported that stimulation of the vestibular apparatus (polarization of the labyrinth by a direct current) causes an increase in neuron reaction to light stimulation and an increase in the critical frequency of flashes. The Soviets also conclude that the interactions of visual and vestibular analyzers is brought about mainly because of their cortical levels. Studies were carried out with deaf individuals to provide further evidence of this. If these studies are all valid, this could lead to the possible development of systems that combine vestibular stimuli with photic-flicker capability in order to achieve a degree of mental disorientation and confusion. The Soviets conclude by stating that functional variations of the cortex of normal subjects caused by vestibular stimulations result in a disruption of cortical-subcortical relationships, which in turn alters the functional states of the retina. Further work in the relationship of visual perception, auditory stimuli, and the cerebral cortex have been reported (226-228). Studies have been conducted on rabbits, cats, and Moscow school children. It was found that repeated stimulation with sound resulted in a complete extinction of neuronal response.

4. (U) The reaction to prolonged rhythmic photic stimulation has interested the Soviets. In experiments with rhythmic light flashes at different frequencies, monkeys exhibited individual sensitivity to certain rhythms. Some animals recruited and transformed the lower frequencies better (7.9 flashes per second), while others responded to the higher frequencies (18 and 25 per second). The following variations in the cortical and subcortical responses to the stimuli were distinguished: (a) simultaneous recruitment of the given rhythm by cells of the motor and visual cortex and subcortex; (b) recruitment of the rhythm only by the visual cortex; (c) recruitment of the rhythm by the visual cortex

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and its transformation in the subcortical structures; (d) recruitment only by the subcortex and motor cortex; (e) transformation in the visual cortex and recruitment by the deeper structures of the brain and motor cortex; (f) simultaneous transformation of the rhythm by all the structures recorded; (g) transformation by the visual cortex. All or a combination of these variations in brain activity could occur in the same experiment (30 to 60 min) (229). A study was reported on non-rhythmic prolonged photo stimulation (230) and on the characteristics of sensory afterdischarge of the human brain to photic stimulation (231). A conclusion was drawn that the specificity of processes in the upper parts of the visual analyzer under a prolonged action of light depends on the inhibitory influences from the visual cortex.

5. (U) The Soviet literature contains reference to experimental work in the effect of high brightness on the rate of eye adaptation to darkness. Kartsev (232) reports that the rate of adaptation of central vision of both eyes to the darkness after light exposures of various durations (1.5,3,6 minutes) after illumination (20,000 to 80,000 lux) was studied in four test subjects in the age group 18-30. A white barium screen illuminated by direct sunlight was used as a light source. During adaptation to the darkness the central vision response time was proportional to the quantity of illumination during disadaptation. A value of approximately 8×10^6 lux per sec was used. Apparently the Soviets feel that they have determined the upper limits to the effects of brightness because Kartsev reports that central vision response remained unchanged with any further stimulus increase. Other researches have prepared curves for the computation of restoration to light sensitivity after exposure to superbright light flashes (233-235). Visual perception in aircraft pilots has also been studied (236).

SECTION II - COLOR AND LIGHT

1. (U) The Soviets have reported that low intensity red light creates an irregular alpha rhythm in humans (237). Another study was conducted on the effects of low intensity red, green, and yellow light on humans (238). Physiological tests were administered to 412 females working in a film processing plant under red, green, or yellow light of low intensity 25 watt bulbs. Complex shifts were found in the central and autonomic nervous system which included marked increases in optical rheobase and chronaxy and lengthening of the latent period of visual and motor reactions

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during the course of the day. The EEG was characterized by an irregular alpha rhythm, frequently followed by more rapid low-amplitude oscillations, an indication of decreased reactivity of the cortical processes. The condition of the autonomic nervous system was judged from shifts in skin temperature and arterial pressure, both of which were much lower at the end of a work shift than at the beginning. The physiological data were supported by the results of a neurological examination which showed a large number of functional shifts. In general, the adverse effects were most pronounced in those who worked in soft red light. Yellow light was less irritating than green.

2. (U) Further evidence of Soviet interest, especially in red light, is provided by research emanating from Soviet military institutes. The dynamics of work capacity of healthy human subjects during adaptation to colored lights was evaluated from the rate and quality of sensorimotor reactions of varying complexity. The subjects, seated at a specially designed control board, were required to press buttons to switch off the lights at appropriate signals during a two hour adaptation period. Adaptation resulted in changes in the rate and quality of the reactions in relation to the color of the light source and the adaptation time. An increase in wavelength increased reaction speed but impaired quality, while a decrease in wavelength had the opposite effects. Red light produced tension and irritability. Yellow light induced a good mood characterized by "increased motor readiness" and sustained attentiveness. Sluggishness and sleepiness were the characteristic reactions to blue light. Green light did not seem to produce any emotional reaction (239).

3. (U) The effect of colored illumination on monkeys has been studied at the Kirov Military Academy. The work reported above also was done at the Kirov Academy. The work as one can see involves not only monkeys but humans. The relationship between agressiveness and color type is of interest especially since the work comes from a known military establishment. An abstract of the work on monkeys follows:

> "In order to determine the psychophysiological specificity and the emotional working capacity as influenced by different colors of the visible spectrum -- so important in technical esthetics in submarines, mines, planes, and light and heavy industries -- the authors used two rhesus monkeys. Sultan, four years old, was rather immobile and aggressive with a big appetite. Generally he sat at the screen and in the case of a mistaken choice

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became aggressive and chewed on the screen. Kahn, three years old, was lively, emotionally responsive but suspicious, was roused by food less than Sultan, and was conditioned by surroundings. He ran about the cage almost continously and seldom sat at the screen to wait for the signal. Food was placed in sight of the monkeys in one of two feeding troughs shut off from the cage. After 30-60 minutes of adaptation to light (red, yellow, green and blue) at different periods, the monkeys were tested for delayed reaction. After red light the animals were restless, they made many wrong choices, and emotionally they were tense. After yellow light there were fewer mistakes. The optimum was green light. Blue light produced definite sedative effects on the body and thought, especially so with Kahn, who sat quietly in the corner and responded to signals with deliberation or indifference." (240)

4. (U) Other research on color thresholds of lights (241), color vision (242-243) and the development of visual color perception (244) have been published. One final paper is of separate interest because it gives an indication of possible Soviet interest in the relationship of anticholinergic drugs and photic stimulation with colored light. The effect of amino glycolates, hydroxypiperedyl-benzylate, benactyzine, and glypin (unknown), in doses of 0.1 to 5 mg. per kg., and of the amino acetates, adiphenine and tropacin, in doses of 1 to 10 mg. per kg. on discrimination of light flashes by the retina was studied in intact rabbits. In photostimulation with white, yellow, green, and blue light, 1 to 25 flashes per second were percieved both before and after the administration of all doses of the anticholinergic drugs. S.A. Kalning (245) reports that rhythm perception proceeded undisturbed even when the intensity of the light was increased after the introduction of the drugs. It is not known if the Soviets have done similar studies employing red light; it would appear to be of interest since it has been shown that red light tends to increase aggressiveness and produce EEG alterations.

SECTION III - CONCLUDING REMARKS AND COUNTERMEASURES

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2. (U) The use of flashing lights to alter or affect human behavior or one's mental state has not received very much research attention. Laboratory tests, however, have revealed some interesting effects which might be worthy of further investigation. At close distances, light of high intensity can alter the alpha rhythm of the brain to bring it into phase with the lights (see Kuproyanovich - 164). It has been noted that a person in hypnosis is more likely to be in the alpha state. Laboratory tests have been devised so that a subject's brain waves can be visually displayed on a wall thus teaching him when he is generating alpha waves. These tests have all been conducted in darkened laboratories. To reproduce such conditions in the field would require lights of very high intensity. The tests could probably only be conducted at night. Such a test would probably require high intensity lights flashing at about ten cycles per second (cps), which is the approximate cycle rate for the alpha waves. Properly classified in the interests of national security pursuant to 5 USC 552(b) (1). Observation of flashing lights operating at ten cps could indicate experiments (218, 219) intended to alter or control alpha waves or could merely indicate coincidence. The color of the lights would seem to be of no importance or significance. Another explanation for flashing tungsten filament lights could be linked to an attempt to interfere with an observers perception of motion (218,219). Short intense light flashes tend to impede the ability to detect motion. The eye detects motion by observing an object traveling from one position to another. If flashing lights were present, the observer would only be able to observe the object for such a short period of time between flashes so it would appear to be stationary. Only prolonged observation and comparison to other objects would enable the detection of movement. Even a short period of indecision could be of importance in the detection of a torpedo for example. Experiments have been conducted in the laboratory which demonstrate that high intensity flashing lights operating at ten cps and conducted for a prolonged period of time result in nausea on the part of the observer. Such flashes could be particularly effective against someone feeling the effects of seasickness.

3. (U) It is interesting to note that the expert above mentioned that color would seem to be of no importance or significance. The Soviets have shown a high interest in the effects of color on human behavior, especially red colored lights. The

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reports from US Air Force personnel also describe the use of bright red strobe lights that pulsate so rapidly that it almost gave a stop-motion appearance that one of the Soviet's aircraft engines was feathered. It might be concluded that, at least to the Soviets, color is a very important consideration.

4. (U) The following information is based on a discussion by Two Canadian scientists who are long standing psycho-optic researchers of the highest rank and who also are oriented towards their military establishments are Doctor Douglas Pearce and Doctor C.E. Mackinnon. The two doctors have specialized in psycho-optic research dating back to the early 1950s. About 1962, they became associated with the Canadian Ministry of Defense in Toronto, Canada. Doctor Pearce and Doctor Mackinnon have been experimenting with human subjects since 1952. Some of their work includes studies on the effects of light and other stimuli on aircraft pilots; it is believed that this research was military oriented. It is felt that their work (and future work) should be studied and watched because of their expertise in the area of light stimuli.

5. (U) Very little literature has appeared on counter-measures or defense against flashing lights. One US expert (246) suggests that perhaps the most simple means of protecting against the adverse effects of flickering light would be a series of filters fitted to eye glasses or goggles, but the wearer would have to be absolutely cognizant of the exact wavelength employed against him to get the desired results. A variable and selective filter for eye glasses could be manufactured. Also, there is optical glass that would limit the field of vision to a few degrees. Based on the discussion of the use of a tungsten light to conceal a laser source, it would be of interest to see if any discernable eye damage had occurred to any of the air crew that was subjected to Soviet red strobe lights. It appears to be imperative that eye examinations must be given to all personnel who report exposure to Soviet flickering lights.

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PART VII

ODOR AND THE ALTERING OF HUMAN BEHAVIOR

SECTION I - BACKGROUND

1. (U) Man has just begun to research the areas of odor and olfactory phenomena. An increasing amount of evidence implicates olfactory mechanisms in communication between the sexes in prosimians and also in their social organization, but to date there is only scant information that olfaction plays a similar role in higher primates (247).

2. (U) Do pheromones operate also in people? There is no evidence that they do not, and some evidence that they do. Many psychiatrists have believed that odor is among the "cues" which operate in the transference situation, while schizophrenic patients, who are receptive to unorthodox ideas and have their sensory gain-control turned right up, claim to "smell" hostility. Some psychiatrists themselves have long claimed to be able to "smell" schizophrenia--the substance involved has now been identified as trans-3-methylhexanoic acid. Olfactory sensitivity varies greatly in humans--a perfumer can smell the differences between skin and hair colors, and many unskilled observers have noted the unique, pleasant skin odor of redheaded women (248).

3. (U) Pheromones control ant behavior and much insect mating. An artificial pheromone (gyplure) can be synthesized to attract gypsy moth males into an insecticidal trap. They are also widespread in mammals. Some mammalian odors, like the n-butylmercaptan of the skunk, or the labeling of territory with urine, are straightforward signals. These influence behavior in the same way as a display of threat, dominance or attraction. The action of a true pheromone is more direct; it is a signal, but its action is more like that of a hormone--the distinction is not total, but it is perceptible, in that many pheromonal odors, at least in mammals, have a chemical shape rather like that of a steroid molecule, and might have been derived from one.

4. (U) Insects take advantage of their keen, specialized olfactory organs (usually the antennae) to guide them to food, the opposite sex, or mark the place to lay eggs. Sense of smell is particularly

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important to the social insects, which manufacture a variety of scents to coordinate the activities of their colonies; they employ odors to warn their kind of impending danger, to recognize intruders, to mark trails leading to food, to move their nests, and to enlist the help of other colony members. Because of this phenomenon, man may be able to control insects through the use of different chemical attractants (249). It may some day be possible for men to control other men by using pheromones.

SECTION II - Behavioral Altering Possibilities

1. (U) A paper presented at the Ciba Foundation Symposium on Mechanisms of Taste and Smell in Vertebrates by M.G.J. Beets is of interest because of the implications of possible chemical warfare use (250). The paper by Beets reports a new line of synthetic odor producing substances with odors closely related to those of some of the steroids. The steroids are very complex, expensive to produce, naturally-occurring substances with strong odors which are quite important in controlling behavior, particularly in lower animals. Steroids are used in contraceptive medicaments, and perfumers have been looking among them for years for a substance to insert into perfumes as an aphrodisiac. Beets and his group have come up with a very simple artificial product which is easy to synthesize chemically and which has the identical smell of the natural substance it mimics. Instead of having a large, complicated chemical structure with, say four rings, Beets has produced a structure with a single ring but with so many groups attached to it chemically that it is the same shape of molecule as the natural substance. The accomplishment supports the theory that odors of chemicals depend upon the shapes of their molecules (251).

2. (U) Beets' paper reports an innocent development, but the principle of the development applies in chemical warfare with regard to the search for "mind benders." In fact, Beets observed that the basic idea of his accomplishment could be extended to drugs, hormones and some other substances, making their synthesis much easier by simplifying the steps of production while retaining the overall shape of the molecule (251).

3. (U) There are at least two problems in using this synthetic mimicry for a placating or confusing effect in chemical warfare. One is getting the substances sufficiently volatile for dispersal in the air. The natural substances are generally not

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volatile, but a way may be found to make them so. Moreover, we are just at the beginning of a knowledge of the chemical controlers that are produced in the body, and it is not unlikely that some of these substances are small-moleculed and thus replaceable by a synthetic substance which could be readily distributed through the air. There is also the possibility of distributing the non-volatile substances through the water system, which is probably more efficient for some purposes.

4. (U) The second problem has to do with whether odor--that is, the chemical traces entering the body which produce the effect we call odor--can have a substantial behavioral effect upon human beings. There is the ancient idea of the aphrodisiacal odor in perfume. Certain food odors can start one to salivate and make one hungry. Certainly, most of the lower animals and insects do have strong odor-responsive systems. A bitch in heat will attract male dogs from half a mile or a mile around. Many insects use similar systems for attracting a mate or for knowing where to lay their eggs. Ants produce a smell warning other ants of danger. In the animal world the phenomenon of pheromone--of odorous signaling substances--can be powerfully controlling, and it would be very surprising if the human being is exempt from this.

5. (U) Many of the secretions of the endocrine glands have profound effects in signaling changes in the basal metabolism and changes in the whole operation of the body. It is probable that more and more substances will be found that are put into the blood stream by the endocrine glands, or by the brain, which control whether we feel awake, or sleepy, or active, or sexy, or hungry or whatever else. So there is a very definite possibility of an eventual chemical warfare application of these substances synthetically reproduced or mimicked. And just conceivably, Beets' principle is the way to go (251).

6. (U) There appears to be a very definite lack of Soviet literature on the subject of pheromones and odor. However, in 1968, Klimenko (252) authored a book entitled "Live Radio Electronics." There are some enticing chapter titles but unfortunately no translation was available at the time of this report. The titles are as follows:

a. Organs of Sense, Special Devices and Analyzers in Animate Organisms.
b. Olfactory and Gustatory Organs
c. Use of Odors

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It is further believed that the book, since it contains a chapter on biocommunication, deals with parapsychological phenomena.

7. (U) Suffice it to say that the Soviets have been working with the synthesis of various mercaptan compounds. Apparently they are looking for oil and water soluble mercaptan compounds with sharp odors (253). The only reason this is mentioned is because the work comes from a pharmacology and toxicology laboratory and not a pure chemistry or industrial laboratory. This suggests that the Soviets are interested in the effects of these compounds on living organisms.

8. (U) Another area of interest is the Soviet work on the influence of carbon tetrachloride on the human body. Belkov (254) reports that small concentrations (8 mg. per cubic meter) decreases the light sensitivity of the eye. The threshold of reflex action of this sensitivity was 6 mg. per cubic meter. Thus concentrations of carbon tetrachloride undetectable by its odor can change the light sensitivity of the eye. This fact has possible application in chemical warfare use as a behavioral control mechanism.

9. (U) Pheromone phenomena has interested researchers in Poland. A 1969 review article with 88 references was written by J. Kwiatkowska. The article deals with pheromones and communication in the animal kingdom (304). A 1970 review by Malicki discusses physical and chemical attractants for insects (305).

10. (U) One approach to behavior alteration in humans is through the possible use of the olfactory sensitivity of insects or animals. One can use a pheromone or other odor-producing agent to create a condition that will cause insects for example to gather to a specific location, e.g. on an enemy troop camp. Another pheromone could be released that could cause aggressive behavior in the insects, this in turn would disrupt the military unit and render them ineffective. The Soviets have been working with attractants for the *Aedes* mosquitoes. They have shown that solutions of lysine and alanine are useful as *Aedes* attractants (306). It might be mentioned that these aqueous solutions would probably be adaptable to aerosol dissemination.

11. (U) Shamshurin et al have claimed that they are able to synthesize the sex attractant of *Pectinophora gossypiella* (307). Burtsev and Gladilin have reported on the isolation and testing for biological activity of the attractant for the butterfly *Danus gilippus* (308).

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PART VIII

SOUND AS A MEANS OF ALTERING BEHAVIOR

SECTION I - GENERAL

1. (U) The psychological and behavioral effects of infrasound and the low ranges of audible sound (those frequencies in the range of 1 to 100 cycles per second, i.e. Hertz (Hz) are poorly documented, especially Soviet work. There is some sketchy data available on sonic (20 to 20,000 Hz) and ultrasound (usually any frequency greater than 20,000 Hz).

2. (U) The Soviets are, however, aware of the biological effects of sound and seem to be interested in establishing protective measures for humans. The Soviets believe that the fact that human beings are not biologically adapted to the rapid tempo, noise, and pressures of an urban industrial society accounts for the increase in cardiovascular and nervous disturbances. Therefore, the Soviets are experimenting with a concept they call "The Zone of Health." One such zone has been established in Baku. The facility includes parks and seashore with provisions for 28 kinds of natural therapy including climatotherapy, kinestherapy, diet therapy, phototherapy, psychotherapy, etc. During 1969, 142,000 "patients" were treated with some 98 percent going home "healthy" (255). Apparently the zone is a form of rest and relaxation with complete absence from excessive sound stimuli. This would appear to be an expensive project and therefore illustrates the Soviet concern for the effects of excessive noxious stimuli on its people.

3. (U) A 1964 book written by G.N. Krivitskaya (256) appears to be of extreme interest; unfortunately only the preface and the table of contents is available in translated form. For readers interested in behavior modifications through sound, it seems that a full translation is a must. Below is described the purpose and coverage of the text and the abridged form of the table of contents. The book is entitled "Effect of Intense Noise on the Brain; Experimental Research." This book covers the problem of change in morphological structures (nerve cells, fibers, synapses, ganglia and vessels) in the neuron systems using different analyzers for the effect of noise stimulants such as an electric bell with a strength of 80-130 decibels (db) of mixed frequency used from one to 44 times. The material is divided into three parts. The first part describes the harmful effect of sound irritants on living organisms. The second deals with experimental data (producing convulsive attacks in a rat in response to sound irritants). In both chapters, further references are cited.

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In the third chapter results of studies are compared with data from references. This book is recommended for neuropathologists, otolaryngologists, therapeutists and pathomorphologists.

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SECTION II - INFRASONIC NOISE

1. (U) The following discussion on the effects of infrasound is based on a report by Maire (257). Due to the lack of appropriate Soviet literature, this discussion is based upon references from other countries.

2. (U) Observed psychological and physiological effects have included significant impairment of compensatory tracking ability, choice-reaction time, foot pressure constancy and peripheral vision. Other effects were greater error increases in reaction times and performance at 5 Hz than at 2 Hz, increased initial reaction time and an increasingly detrimental effect on visual performance as frequencies were increased above 8 Hz, with maximum effect occuring between 40 and 50 Hz. Gavreau (258) observed that high intensity infrasound caused sensations of panic and the impression that the head would burst. Infrasound at a frequency of 7 Hz (emitted by a faulty industrial ventilator) caused difficulty in the performance of mental activities and precision work. Other studies (259, 260) have shown that at exposures to stimuli of 15-17 Hz, at SPL's (sound pressure level) of approximately 104 dB, subjects experienced feelings of apprehension. During initial exposures to intense sound fields, many individuals presented symptoms typical of generalized stress reactions, particularly in cases where sufficiently effective ear protectors were not in use. Severe storm activity in North America was compared with the automobile accident rate and the rate of absenteeism among school children in the area of Chicago, Illinois during May 1967. The results suggested that a correlation may exist between the presence of infrasonic disturbances in the area and changes in selected patterns of human behavior (261).

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3. (U) Very little information is available on animal reactions to infrasound at this time. According to Maire, it has been reported that a frequency of 7 Hz caused "epileptic fits" and the subsequent death of rats at some distance from the laboratory in which the generator was located. There is a newspaper article claiming that during experiments with a frequency of 7 Hz, all dogs in a nearby apartment building "went completely insane with fear" (262).

SECTION III - SONIC NOISE

1. (U) There have been several pertinent Soviet reports on the psychological effects of noise in the 20 to 20,000 Hz range. Among these was a report by Korotkin et al (263) that showed changes in auditory thresholds as a result of suggestion during hypnosis. In 14 of 16 subjects, the deterioration or improvement in audibility of sound signals suggested during hypnosis produced a significant change in auditory sensitivity in accordance with the suggestion of the hypnotist. More substantial changes in auditory sensitivity (up to 60 db) followed the suggestion of poor audibility. The range of changes in sensitivity following the suggestion of good audibility was narrower (up to 21.4 db). The lowering of the auditory thresholds in response to a suggestion of good audibility was largely dependent on their level on the day of the experiment. The higher the original levels, the more they dropped as a result of suggestion. The considerable individual variations in auditory sensitivity caused by suggestion were obviously related to the degree of suggestibility of the subjects.

2. (U) Rudenko reports that canine death can be caused by strong acoustic stimulation (264). Prolonged attempts (for six weeks) to evoke neurosis in a dog possessing exceptional strength and equilibrance of nervous processes by using super-strong acoustic stimuli failed to produce any appreciable disturbances of its nervous activity. Then to increase the excitability of the dog's nervous system and raise its working capacity to the limit, a loud tone (120 decibels) was combined with the administration of caffeine in 0.5, 1.0, and 1.5 grams doses 30 minutes before the experiment. Ten minutes after a 1.5 gram dose of caffeine was administered, there was a drastic tonic convulsion of the entire body and a few seconds later the animal died. This indicates that this type of animal has strongly pronounced protective mechanisms and that destruction of these mechanism may lead to a breakdown of higher nervous activity or to even graver consequences.

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3. (U) Alekseyev and Suvarov (265) studied the speed and intensity of acoustic and visual reactions in subjects exposed to noise from thirty minutes to four hours. Using 70 to 90 db noise intensities in a soundproof chamber, the investigators recorded vocal and motor reaction response times after varying exposure durations. Prolonged (3-4 hour) testing at either db level caused fatigue of the central nervous system, reduced effective response, and disturbed relationships between motor responses and strength of stimulus. Noise of 70 db produced no essential changes in responses within the first hour of testing, while 90 db noise caused changes in vision dependent reactions and slowing of reaction times.

4. (U) Strakhov (267) has investigated the effect of high intensity noise (95-100 db, 1500-3000 Hz) on EEG patterns. In human subjects a gradually increasing desynchronization of cortical rhythms was noted together with the appearance of slow waves. In rabbits and cats, both desynchronized and synchronized rhythms occurred. The general character of noise induced changes, the considerable after effect of noise, accompanying changes in respiratory function, and the presence of a cardiovascular reaction suggested that subcortical brain structures (especially the reticular formation of the medulla oblongata) were primarily responsible for the genesis and development of these changes. This hypothesis was confirmed by electrophysiological studies with potentials taken directly from subcortical structures. In addition, histological examination showed pronounced changes in medullary nerve cells. In a later report (267), Strakhov reported that a generalized alpha rhythm depression develops during a period of several minutes as a result of exposure to 95-100 db noise, but that if photic stimulation were applied at the beginning of the noise, alpha rhythm bursts appeared which weakened, then completely disappeared as the noise action continued. Discontinuation of the noise first brought about new bursts of alpha rhythm in response to photic stimulation, and subsequently led to its complete restoration. The administration of scopolamine delayed the development of the changes. The results were regarded to be due to development of an inhibitory state in the cerebral cortex due to the activation by noise of the reticular structures of the inferior parts of the brain stem and the release of inhibitory mechanisms of the nonspecific thalamus. Other EEG work has been reported by Korzh (268) and by Doroshenko et al (269).

5. (U) On a more subjective psychological level, Vogel (270), classifies effects into three categories: gross, annoyance, and subtle, arranged roughly according to decreasing sound intensity. Subtle involves sounds used to instill fear, anxiety, confusion, panic, etc., examples of which would be the bugles played by

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the Communist Chinese in the Korean War and the Confederate "yell" of the Civil War. Annoyance sounds would be sounds used to interfere with work performance such as the ability to learn and retain. Gross psychological damage would be the complete loss of the ability to function, destroying or "muddling" of the conscious to such a degree that the ability of all but involuntary actions (breathing, heart beat) would be destroyed. Vogel states that nowhere in the scientific literature could there be found a documented incident where high intensity sound caused a gross psychological effect, or any closely related effect, on a man.

6. (U) The intense noises associated with aircarft may in many ways be similar to those that might be purposely generated under combat conditions. In this respect, the work of Terent'yev, Sheludyakov and Sviridova (271) may be quite relevant to assessment of the psychological effects of noise on highly motivated, trained personnel. These investigators observed 90 people from an aviation engineering technical staff, who, in the course of their work, were subjected to the influence of noise with an intensity of 100-102, 110-112, 118-120, and 130-136 db daily, or two to three times a week for one to six hours at a time. The majority of the technicians exposed to 130 db and more, complained of general fatigue, reduced work capability, headache, unpleasant sensations in the region of the heart, noise and ringing in the ears after each day's work, less frequently of itching over the entire body, pains in the front wall of the abdomen, and sometimes nausea and vomiting. In some, sleep was irregular and appetite lowered. In a majority, these phenomena disappeared after a nights sleep; in others after 2-3 days if work under noise conditions was not repeated. Analysis of case data showed that the frequency, expression and duration of unfavorable sensations were determined by both intensity and noise duration. Individual characteristics of those examined were also important. The symptom complexes described developed more frequently and earlier in people in whom head trauma, hyperthyroid, neurocirculatory dystony and other illnesses had been noted. In order to validate the observations made under work noise conditions, fifteen healthy volunteers were tested under laboratory conditions. After exposure to noise with an intensity of 100-102 db for one hour, some subjects complained of noise in the head and sleepiness; after three hours, five of eleven complained of general fatigue and one, of sleepiness; after six hours, all examinees complained of noise and ringing in the ears, headache and general fatigue, reduced appetite, nausea, sleepiness and general irritability. After exposure to an intensity of 110-112 db for up to three hours, all subjects complained of headache, fatigue, sleepiness, and a sensation of deposits in the ears; one subject complained of nausea and reduction of work capability.

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Under daily six hour exposure to noise of 110-112 db for five days, the changes increased from day to day: fatigue, headache and general malaise. After the third day the symptoms did not disappear by the beginning of the following work day. With noise of 118-120 db, a single exposure elicited the same changes as at lower levels, but the degree of expression increased significantly and the aftereffects lasted longer. Especially strong reactions were observed in three and six hour exposures. All volunteers complained of noise and ringing in the ears, general fatigue and heaviness of the head. In some subjects, paleness of the skin, involuntary twitching of face muscles, apathy or irritability, perspiration, or tremors of the eyelids and fingers appeared. One general observation of considerable significance was that the effects of prolonged noise exposure are cumulative.

7. (U) Mikhaylova and Byshevskiy report that 2000 Hz for various periods of time (from 30 minutes to 10 days) on exposed rats may contribute to inhibition of the anticoagulation process (272). Further studies on rats exposed to 2000 Hz for various time limits showed a reduced transketolase activity (273).

8. (U) Yuganov et al (274) have suggested that there be a standardization for admissible limits for high intensity sound. The effect exerted on humans by noise of 114-116 and 125-126 db with an acoustic energy of 500 Hz was studied. The auditory thresholds, blood pressure values and time of response to light stimuli were measured. Sixty-four healthy male test subjects were used in 152 experiments. Adverse changes in the acoustic analyzer, cardiovascular system and locomotor analyzer were detected during an exposure to 125-126 db noise. Taking into account the changes in the thresholds of skin vibrosensitivity when the ear was protected, it is concluded that the skin becomes a second gauge for acoustic energy beginning with 125-126 db. Noise of 114-116 db is considered admissible during powered stages of spaceflight.

SECTION IV - ULTRASONIC NOISE

1. (U) Various psychological effects to exposure to ultrasound (greater than 20,000 Hz) has been reported in the Soviet literature. Mel'kumova and Koroleva (275) reported psychological-subjective findings based on clinical observations of 104 individuals exposed to ultrasound in an industrial environment. The main complaints of the examinees were headache, extremely pronounced fatigability, tiredness and a general weakness. The onset of fatigue in most of the subjects began as early as two to three hours after starting work with simultaneous development of headache, with the latter

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increasing progressively in intensity until the midday break. For some, the 30 minute break at noon restored work capacity and lessened the severity of the headache. Considerable exhaustion was experienced by most subjects by the end of the workday. Besides the marked fatigability and tiredness the examinees complained of a constant feeling of general weakness and vertigo with dimming of vision occurring by noon, at the end of the workday, under physical or mental strain and in stuffy rooms. These sensations caused loss of consciousness in some individuals.

2. (U) Another effect of ultrasound was disturbances in sleeping patterns. The need for sleep was felt by one group during actual work, before the noon break, or toward the end of the work day. Some individuals were overcome by drowsiness during short pauses in work and in longer pauses fell asleep standing up or in other normally uncomfortable positions. In rare cases daytime drowsiness was of the nature of a hypnagogic state, during which the individuals continued to be oriented in their surroundings, hear speech, follow the industrial process, and at the same time, sleep with clear dreams. Changes in nocturnal sleep were also reported. Thirty-eight per cent of the workers complained of drug-like heavy, dreamless sleep, while another group (18%) slept superficially and intermittently with difficulty in falling asleep and, in some cases, with oppressive dreams.

3. (U) Other reported effects were morbidly sharpened perception of ordinary sounds during off-duty hours, leading to sleeplessness and the opposite extreme, in which one worker reported the sensation of "wanting to sleep day and night," even during the workday. Heightened irritability was detected in 30 persons, while in 15 others, intellectual impairments were found. These included pronounced loss of memory (especially for current events), decreased perception, and inability to master new material.

4. (U) During clinical examination of this group of workers the investigators noted lassitude, apathy and retardation of movements and reactions. The examinees rarely expressed their complaints themselves, but more often had to be prodded verbally in order to elicit information. Replies to questions were monsyllabic and conversational initiative was lacking.

5. (U) In other studies conducted by the Institute of Hygiene imeni Erisman, Yefimov (276) reported findings including weakening of the sense of smell and decreased taste sensations as well as certain disturbances in digestion. Of the gastrointestinal symptoms, the most frequently noted were poor appetite, nausea and a tendency toward constipation. In some cases these symptoms were

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combined with pains in the stomach which radiated into the right subcostal region. Menstrual disturbances (dysmenorrhea and prolonged amenorrhea) were detected in several women workers, but gynecological examination revealed no inflammatory or proliferative disease in any of them. Many men among the examinees complained of reduced sexual capacity. Two men, aged 46 and 48, with long work exposure on ultrasonic installations displayed sexual impotence.

6. (U) The organ and cellular effects of ultrasound have also been documented. Gorshkov (277) cites studies by Wolf in which small aquatic animals were exposed to varied durations and intensities of 800 kHz ultrasound. The results suggested that a species specific relationship may exist for sensitivity to ultrasonic irradiation. Gorshkov also cites experiments by Buchtala, who described spontaneous bone fracture in a young dog after ultrasonic irradiation, and Majno, who exposed the extremities of a rabbit to ultrasound at 960 kHz, 6 watts/cm^2, for 30-120 minutes. Edemas of soft tissues, ulceration, periosteal separation from the bone, and subendosteal hemorrhages resulted. Necrotization of the bone eventually followed, although the joint cartilage and epiphyseal growth plates remained completely unchanged.

7. (U) Klupp (278) et al exposed the kidney region of animals to 2 MHz ultrasound at intensities greater than 5 watts/cm^2. Morphological changes were found in the primary convoluted tubules, the loops of Henle, the secondary convoluted tubules, and the descending arms of the loops of Henle. The connective tissue elements and collecting tubules of the medullary layer were found to be more resistant to ultrasound. Other investigators have observed dilatation of the renal blood vessels, hemorrhages in the medullary and cortical layers, and degenerative changes in the epithelium of the urinary tubules following exposure to high intensity sonic waves.

8. (U) The behavioral effects of ultrasound on animals have been examined to a limited extent.

9. (U) Wood and Loomis (279) exposed fish to ultrasound. The fish showed initial disquietude, then rushed from side to side in the tank, swam to the surface and attempted to gulp greedily for air. Some, after as little as one minute of exposure, became sluggish, motionless, or showed symptoms of disturbed equilibrium and weak, irregular respiration. At times, sporadic attacks of renewed frenzied activity followed, with rapid respiration and cardiac activity. Subsequent increase in intensity killed the fish.

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10. (U) In chronic experiments with ultrasound of moderate intensity, Onanov (280) observed changes in animal behavior (apathy, lassitude, refusal of food, emaciation, trophic ulcers and loss of fur). Death due to stress with adrenal failure has been reported in sheep subjected to ultrasonic irradiation at high intensities similar to those used in the treatment of human auditory disease. Stress due to ultrasound of lower intensities has also been claimed (281).

SECTION V - CONCLUSION

1. (U) Although the above discussion on Soviet research in the areas of biological (psychological) properties of sound was brief, it expresses an awareness on the part of the Soviets of the potential harmful effects on humans. Some Soviet research has indicated that the behavioral changes in man and animal are of prime importance.

2. (U) According to Maire (257) scientists from Warsaw Pact countries have evinced interest in French sonic and ultrasonic sirens and pneumatic compressors for acoustic wave generation. Therefore, the Soviets may be expected to continue research on small siren powered emitters for mob control and on larger acoustic arrays for area denial and anti-infiltration application.

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PART IX

SENSORY DEPRIVATION

1. (U) A relatively recent development in experimental psychology has been the study of the effects upon human behavior of a severe reduction in the level and variability of visual, auditory, and tactual-kinesthetic stimulation. The experimental attempts to achieve such a non-changing sensory environment are often referred to by such terms as stimulus deprivation, sensory or perceptual deprivation, or sensory and perceptual isolation. Whatever the terminology, this condition can produce marked behavioral and physiological changes. It has been demonstrated that a varied and patterned sensory environment is essential to the maintenance of normal human behavior. If a person is required to live for many days in a monotonous, non-changing sensory and perceptual environment, his physiological and psychological processes may operate in extraordinary ways (282).

2. (U) The following discussion is excerpted from a report by Zubek (282). According to Zubek, the first experimental work on perceptual deprivation began in 1951 at McGill University. Its purpose was to further the understanding of the mechanisms underlying "brainwashing" (e.g. Korean War) and of the lapses of attention noted under monotonous environmental conditions, such as watching a radar screen for a prolonged period of time. The results of the McGill research were very enlightening. The subjects, who were paid to do nothing except lie alone in a semi-soundproofed chamber for several days, wear translucent goggles and listen to a constant masking sound of low intensity, reported a variety of unusual subjective phenomena e.g. vivid and highly structured hallucinations, delusions, and gross changes in the appearance of the perceptual environment upon emerging from isolation. In addition to these introspective reports, objective test data were obtained which indicated an increased susceptibility to propaganda material, impairments in cognitive and perceptual functioning, and a progressive slowing of occipital alpha frequencies with increasing duration of isolation.

3. (U) The results described above, together with several other post-World War II developments, soon started worldwide interest in the effects of sensory isolation and confinement. One source of interest came from the highly publicized "confessions" extracted by communist interrogators (e.g. the Cardinal Mindzenty case). What little information was available suggested that the results were obtained by techniques which often employed solitary confinement

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and the deliberate impoverishment of the prisoner's perceptual environment (283). Drugs and physical torture were apparently not used. Another development was the arrival of the space age in 1967. Other advances, as reflected in increased use of submarines, isolated radar and meteorological stations, and of automated equipment in general, also provided considerable impetus to the initiation of research programs dealing with reactions to restricted sensory and social environments.

4. (U) Despite the recounts of the Mindzenty case, the Soviets did not publish reports on sensory deprivation until the mid 1960s. The Soviet data is usually published in their aerospace or related literature. Hinkle in 1969, however, has reported that under prison isolation, as this has been carried out by Soviet and Eastern European state police, most prisoners developed symptoms of disorganization within three to six weeks; but some have been known to endure this for many months, and some have succumbed within days (284). Based on Hinkle's statement and numerous other accounts on the treatment of prisoners in the Soviet Union and other communist countries, it seems safe to say that they have had some experience with the effects of sensory deprivation prior to their acknowledgment of actual research in this field.

5. (U) The Soviets are quick to point out that the Canadians and the Americans were the first to report and maintain research efforts in the field of isolation and sensory deprivation (SD). Perhaps to detract attention from the prison reports, Kosmolinskiy reports that from the mid-fifties, sensory deprivation experiments attracted increasingly greater attention in scientific investigation centers of the Army, Air Force, and Navy of the United States and Canada (285). In another section of Kosmolinskiy's report, he mentions, however, that the question of sensory deprivation was already established in the USSR in the twenties by I.P. Pavlov. The distinction between Pavlov's work and research by Galkin in 1932 (286) as compared to Western work is that the Soviet efforts were more humane. Kosmalinskiy states that abroad, crueler forms of isolation were imposed and that sensory limitations were created by the most severe means e.g. plaster cast usage.

6. (U) Western literature on sensory deprivation deals with many of the psychic manifestations that appear during or after the experiment. Many investigators noted significant changes in the emotional sphere of subjects in sensory deprivation (50) experiments: the appearance of varying degrees of apathy, melancholy, anxiety and fear (287). Sometimes, apathy and dulled consciousness of the subjects become so profound that one of the most important

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instincts is destroyed - the instinct of self-preservation - and the person contemplates suicide (288). The Soviets contend that serious psychological disorders in subjects as described above are evidently related to the exessive burden of the severe experimental conditions on the physiology of the subjects. The Soviets continue by stating that in the above studies it is not only a matter of the action of isolation and SD factors, but also a number of supplementary factors complicating the circumstances of the experiment (restraint with straps, plaster casts, uncomfortable postures, and occasional painful sensations). The Soviets further believe that Western experimental work does not appear to be a true model of human life and work conditions, especially in space flight simulation SD studies.

7. (U) According to Kosmolinskiy, experiments on the limitation of stimuli and conditions of isolation carried out by Soviet scientists showed that a healthy person with greater will power can remain in a soundproof chamber for an extended period of time without any psychic changes threatening the condition of his health. The various specific sensory illusions which appear are not of a morbid nature. This form of sensory illusion pertains to illusions associated with incorrect perception of stimuli, the information characteristic of which is insufficient (289). The illusions themselves do not appear to be a sign of psychic disease and often are encountered in healthy persons, especially in those instances when something interferes with the distinct perception of visual and auditory images; for example, poor lighting. Baseline psychological status, fatigue, distraction, states of expectation and fear are of great significance. O.N. Kuznetsov and V.I. Lebedev (289) in describing the presence of illusions involving recognition errors in subjects under investigation in the soundproof chamber as a consequence of insufficient information, of a feeling of the extraneous presence of eidetic images, ideas of relationship and over evaluations, do not consider these phenomena to be pathological, and propose calling them pseudopsychopathological. According to the data of F.D. Gorbov (290), psychopathological phenomena were absent in the experiments of Soviet cosmonauts in a soundproof chamber.

8. (U) Soviet scientists assume that the isolation factor must be studied in conformity with conditions which can occur on space flights. In this regard, the most important factor appears to be that a person believe in the necessity of the work which he is to accomplish, and that he have a clear conception of the objects of a given experiment. Each experiment in the soundproof chamber is a moral and volitional examination for future cosmonauts, for example, which prepares them for the performance of complex tasks.

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9. (U) Most Soviet literature, as was mentioned previously, dealing with SD experiments is related to the space effort. The purpose for discussing some of the Soviet views above was to illustrate the rather mundane work that they report in the open literature. The more interesting aspect is their awareness and apparent concentration on Western literature as is evidenced by the Kosmolinskiy report. The Soviets don't go so far as to condemn the Western approach, but seem to be quick to point out the differences from their approach which is reported to be not as severe. Based on early reports on "confessions" and "brainwashing" in communist countries, it would be naive not to assume that the Soviets do not have a clear conception of the effects of sensory deprivation. Based also on their work in certain areas such as the biological and mental effects of light and sound it should be assumed that the capability for the application of SD in field situations exists. Perhaps Kosmolinskiy gave himself away when he stated that experiments show that isolation and sensory deprivation create complex physiological and psychological reactions in the human organism. Measures must be developed to prevent these disorders, which can involve several physiological systems and lead to a decrease in his capacity for work and other psychological manifestations. Zubek's (282) work of 1969 indicated that a prolonged period of perceptual deprivation and confinement can produce, in most cases, a considerable disturbance of brainwave activity. Zubek in concluding his report said, "In the light of these results, one can only wonder about the possible physiological and psychological state of prisoners of war and others who, in the past, have been isolated for months or even years."

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PART X

ELECTROMAGNETIC EFFECTS

1. (U) Over a span of years which exceeds that of a century, numerous researches and observations have been conducted and published on the physiological and psychological effects of electric fields. As Davis (293) has stated in his exhaustive review of the subject, not much of substance has derived from all the attention which has been paid to the physiological effects on living organisms of placing them in environments which have been changed by manipulating one or more electromagnetic parameters. Somewhat more in the way of positive findings has been published as they relate to the psychological effects. There appears to be more literature from Soviet sources than from Western sources concerning the effects of electromagnetic fields on the central nervous system.

2. (U) A question was raised concerning the possible hazard to personnel working with a device which generated very high field density electromagnetic pulses. Of particular concern was the possibility that people working on an object which was to be subjected to the pulse might themselves receive the energy by virtue of a premature triggering or some other mischance. The generator created an electromagnetic field in the form of a pulse which had a duration of 3×10^{-9} sec, at a voltage of 1.0 megavolt. In essence, a Van de Graaf generator was used to charge a bank of high capacity condensers. The condensers were discharged into a load consisting of an array of aerial wires so that a high potential difference was caused to exist between them and a grounded metal mesh plate beneath. With the breakdown of the air dielectric an intense pulsed field was created. On one occasion when the generator was being tested after its erection, a bird flew under the aerial wires just as it was pulsed. The bird fell from the sky and flopped about in a rather disorganized way for a minute or so. It then appeared to regroup all those things which birds must have in order to fly, and flew off about its avian business apparently none the worse for the experience. This incident was unsettling to those working with the generator, so a search was made in the literature for something germane which would indicate whether or not a hazard to operating personnel existed. This literature search was reported by Hirsch et al (294). According to Hirsch, not very much was found except for a paper by Salvingnac et al (1967) which related to the psychomotor disturbances in air crews when their airplanes were struck by lightning. The density of the electromagnetic fields to which these people were exposed

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was probably of the same order of magnitude and duration as was that associated with the EMP generator, since a lightning bolt generates a cylindrical electromagnetic field of about 10 megavolts at its center with the density decreasing toward the periphery. The duration is about 6 microseconds. Salvingnac described the psychomotor disturbances as a "slowing of thought processes and psychomotor reactions" from which the people recovered within a brief period apparently without permanent damage.

3. (U) The above information concerning pulsed electromagnetic energy could have behavior implications just as the photic-flicker "experiments" described in PART VI could have. The "slowing of thought processes and psychomotor reactions" could lead to behavioral changes effecting the ability of an individual to perform a critical task such as piloting an aircraft. It cannot be determined if the report mentioned above initiated or accelerated Soviet research in the area of the psychological or behavior effects of electromagnetic energy. Since the early 1960s, the Soviets have been publishing reports on the effects of electromagnetic and magnetic fields on the central nervous system of animals. Although the Soviet reports do not contain specific reference to effects on humans, the data would give one the impression that they have extensive knowledge of the subject as it might apply to humans.

4. (U) One of the more outstanding publications from the Soviet Union is a book prepared by Yu. Kholodov (295). The book is a compilation of Soviet and Western work in the area of electromagnetic effects on the central nervous system. The bibliography to the book contains 455 entries. A large portion of the text directs itself to the subject of the changes in conditioned reflexes and sensitivity to light in birds, rabbits, and fish. The effects of ultrahigh and superhigh frequencies on the electrical activity of the rabbit brain is extensively discussed. A report on constant magnetic fields is also presented. Although the book addresses physiological responses, it points out that the Soviets have considerable knowledge and a keen interest in the field of electromagnetic energies.

5. (U) The UCLA Brain Information Service in Los Angeles is a bibliographic collector of information which is pertinent to this discussion. The service has compiled an extensive bibliographic list on the biological effects of electromagnetic fields (below visible frequencies) especially on the central nervous system. The list contains many Soviet references. However, the list is constructed around research that addresses the physiological aspects and not the psychological or behavior effects (296).

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6. (U) A Soviet review article concerning the effects of superhigh frequency (wavelength of from one millimeter to one meter) on the central nervous system is worth incorporation into this report. Although the work is primarily physiological, it is meaningful because it contains some of the important areas of interest to the Soviets and could be correlated to Soviet work with other frequencies. Kholodov (297) reports that the effect of SHF on the functions of the central nervous system is of particular interest. So far, few studies have dealt with this subject. Kholodov contends that foreign investigators (chiefly American) use an SHF field with an intensity on the order of tens of watts/sq cm, which results in a considerable heating of the brain (above 40 degrees C). Depending upon the duration of the radiation, mice and rabbits have stopped eating for some time, or have made spasmodic movements, and even died. Post-mortem examination of the animals have shown that the action of the powerful SHF field has resulted in destruction of the brain cells. Especially extensive destruction has been observed in the inter-brain and mid-brain. When the head of a monkey is exposed to a strong SHF field, the animal behaves normally for the first minute or two, and then covers his eyes and starts to go to sleep. But a minute later he wakes up; the rate of respiration increases; the pupils dilate despite the bright illumination; and there is a heavy secretion of saliva. After some time the monkey begins to shake with convulsions and utter cries. If the radiation is discontinued, by the following day the monkey in no way differs from other monkeys who have not been exposed to radiation. If exposure is continued, the animal dies after a few minutes. Experiments have shown that when men or animals are exposed to radiation, there is a change in the sensitivity to sound, light, and olfactory stimuli. A study of the receptors in the skin, the gastrointestinal system, and the circulatory system has shown slight changes in them after exposure to the action of SHF. Consequently, the SHF field can act on the first link in the reflex arc. At the same time, SHF may act directly on the central nervous system. On the other hand, the appearance of slow waves in the record of the biological currents of the cerebral cortex, the inhibition of reflex activity, and the appearance of various vegetative reactions indicate action of the SHF field on the inter-brain, where the higher vegetative centers are located. The data from physiological experiments check very well with the results from morphological investigations. After exposure to SHF, reversible structural changes were observed in the cerebral cortex and in the inter-brain. It may be assumed that those areas of the brain are the most sensitive to the action of an SHF field, although if the intensity or duration of the action is increased, other

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parts of the central nervous system will also participate in the reaction. Kholodov concludes by stating that only further experiments will help us to explain the mechanism of the direct action of an SHF field of nonthermal intensity. But it can already be stated that these effects can be produced by an electromagnetic field other than one of super-high frequency.

7. (U) Although Kholodov's article is early 1960, it points out the interests the Soviets had over a decade ago; for that matter, Vasilev was working with electromagnetic radiation in the 1930s in his investigations of the transport methods for ESP. It is evident that the effects of electromagnetic frequencies below visible light on man are of interest to the Soviets. Kholodov states that there is a change in the sensitivity in man to sound, light, and olfactory stimuli. One can only make certain guesses as to the possible relationship in Soviet research between electromagnetic radiation effects and behavioral responses to other stimuli that they are working with.

8. (U) Christian (298) reports that the Soviet use of infrared to cause gross damage to human targets is conjectural. However, Christian in his report states that studies are being conducted in the USSR which would lead one to conclude that infrared is being considered as an anti-personnel weapon. Temporary blindness, even of long duration, does not endanger the eye and yet is quite serious when it alters the behavioral response of pilots or sentries to their mission. Despite an extensive review of Soviet literature on the effect of infrared radiation on humans, Christian could find no reports on psychological effects. There was only one report on behavior effects of infrared radiation. A report by Dul'dier (299) states that a temporary loss of work capacity among workers in hot shops, such as foundries, is directly related to the dose of infrared received. He found somewhat surprisingly, that temporary loss in working capacity is found more frequently with younger workers, those on the job less than five years, than the more experienced workers.

9. (U) One report has appeared in the Soviet literature relating to the behavior effects of ultraviolet radiation. A study by Al'bitskaya (300) seems to show that ultraviolet radiation can show a decrease in the latent period of speech reaction during association testing. Al'bitskaya studied the effect of 136-400nm ultraviolet radiation on 15-16 year-old technical school students as measured by their response in a conditioned reflex situation and the length of the latent period in motor and speech reactions.

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She concludes that the response system based on speech is more excitable than the response system based on sensory perception since it can be stimulated by ultraviolet radiation.

10. (U) Low frequency electromagnetic fields have been found by Kevanishvili and Zhgenti to generate sonic and ultrasonic oscillations in living organisms (301). These oscillations produce elastic deformations in the organism. If the frequency of the outside field corresponds to the oscillation frequency of the cells, the latter deteriorate as the result of the mechanical resonance.

11. (U) More recently, research at the Riga Medical Institute has shown that high-tension static electrical fields affect the neurohumoral regulatory systems (301). Work is now apparently underway that is investigating the possibility of an effect of strong electrical fields as the energy balance of living objects at this institute.

12. (U) Sweeney (302) has prepared a study on the biological effects of electromagnetic radiation in the range of 3 to 300,000 mHz. The study covers research in the Eurasian communist countries. This exhaustive report again contains primarily information on the effects of electromagnetic radiation as it applies to physiological responses, not psychological or behavioral.

13. (U) Since almost all of the Soviet data on electromagnetic radiation (below visible) applies to physiological response, one can only imply that they have substantial knowledge of the psychological effects. Even if psychological or behavioral research is under way in the USSR, it is doubtful that they would publish it. There have been certain indications in the past that the Soviets may be actively engaged in weapons research employing electromagnetic radiation. Doctor V.V. Meriakri, the Director of the Institute of Radio Engineering and Electronics of the Soviet Academy of Sciences stated during an early 1969 visit to the United States, that he is studying the radiation absorption properties of biological fluids.

Properly classified in the interests of national security pursuant to 5 USC 552(b) (1).

It is impossible to assess the truth of this assertion on the basis of ths information alone. Much more information about Meriakri and hisresearch organization is needed.

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APPENDIX I

PERSONNEL AND INSTITUTES

CURRENT EVENTS

PART A - Affiliation Known

Serbsky Central Scientific Research Institute of Forensic Psychiatry, Moscow, USSR

LUNTS, D.R. (possible KGB=Colonel)
MALTSEVA, M.M.
MARTYNENKO (fnu)
MOROZOV, G.V. (Director)
PECHERNIKOVA (fnu)
TABANOVA (fnu)
TALTSE (fnu)
TUROVA, Z.G.

The Republican Hospital of the City of Riga, Latvian SSR

KRASNYANSKY, O.A.
MARKIS, L.A.
RUSINOVA, Z.G.

Skvortsov-Stepanov Psycho-Neurological Hospital Number Three, Leningrad, USSR

BROVERMAN, L.B.
SHCHERBATOV (fnu)
SVETLANOVA, N.K.

KGB

BERYOZOVSKY (fnu)

Chernyakhovsk Hospital (Chernyakhovsk, formerly the East Prussian town of Insterburg)

BELOKOPYTOV (MAJOR) Prison Commandant (fnu)

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PART B - Affiliation Unknown

ALEKSEYEVNA, T.
DETENGOF, F.F. (Tashkent, Uzbek SSR)
KUZNETSOVA, E.I.
NIKOLAYEVICH, L.

PART C - Important Institutes - No Personalities Available

VLADIMIR PRISON (100 miles east of Moscow)
ORYOL PSYCHIATRIC HOSPITAL (170 miles southwest of Moscow)
BUTYRKA PRISON (Hospital Section), Moscow, USSR

SOVIET PSYCHOLOGY AND PSYCHIATRY - RESEARCH

PART A - Affiliation Known

Department of Psychology, Moscow State University

KONOVALOV, V.F.
KRINCHIK, E.P.
LURIA, A.R.
TIKHOMIROV, O.K.
VASILYEVA, V.M.
VORONIN, L.G.

Military Medical Academy (Leningrad)

BODROV, V.A.

Naval Medical Academy

SHASTIN, N.R.

Sechenov Institute (Leningrad)

FADAYEVA, D.K.
TRAUGOTT, N.N.

Pavlov Institute of Physiology (Leningrad)

ANOKHIN, P.K.
KOLTZOVA, M.M.
ROGOVENKO, Ye.S.
ROKOTOVA, N.A.

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Leningrad State University

GALUNOV, V.I.
GUBINSKIY, A.I.
LIVSHITS, V.A.

USSR Academy of Medical Sciences (Leningrad)

BEKHTEREVA, N.P.
BUDASHEVSKY, B.G.
ORLOV, V.A.

Institute of Higher Nervous Activity and Neurophysiology (Moscow)

ALEKSEYEV, M.A.
ASLANOV, A.S.
ARATYIAN, E.A.
LIVANOV, M.N. (Chief)
NAPALKOV, A.V.
RUSINOV, V.S.
SIMONOV, P.V.
YERSHOV, P.M.

USSR Academy of Sciences (Moscow)

BASHKIROV, O.A.
BOGACHENKO, L.S.
BRIKS, Z.N.
FELBAUM, A.I.
FUFLYGINA, T.P.
GERASIMCHUK, V.A.
IVANOV-SMOLENSKY, A.G.
KORBATOV, B.M.
MASLENNIKOVA, V.M.
MUCHNIK, I.B.
NARODITSKAIA, G.D.
NOVIK, I.B.
SEREDINA, M.I.
SHITL'MAN, E.V.
STROKHINA, T.V.

Institute of Psychology, Academy of Pedagogical Sciences (Moscow)

BOYOKO, E.I.
CHUPERIKOVA, N.I.
EL'KONEN, D.B.
ISTOMINA, Z.M.

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LEONT'YEV, A.N.
LOMOV, B.F.
NEBYLITSYN, V.D.
OSHANIN, D.A.
SAMOKHVALOVA, V.I.
SHVARTZ, L.A.
SMIRNOV, A.A.
TEPLOV, B.M.
USHKOVA, T.N.
ZAPOROZHETS, A.V.

Pavlov Hospital (Leningrad)

LEBEDEN, B.A.

Soviet Academy of Medicine, Institute of Psychiatric Research

SHCHIRINA, M.G.
SNEZHNEVSKIY, A.V.
VARTANIAN, M.

PART B - Affiliation Unknown

SVYADOSHCH, A.M. (Karaganda)

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VALUS, N.A.

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SERGEYEV, G.A.

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Research Institute of Psychology, Ukrainian SSR Academy of Sciences

GUBKO, A.
LEONTOVICH, M.A.
LEONTOVICH, A.V.

Moscow Institute of Aviation

ZIEGEL, F.U.

Laboratory of Vision, Institute of Problems of Information Transmission of the USSR Academy of Science

BONGARD, M.
SMIRNOV, M.S.

Pavlov Institute, Moscow

KOZAK, V.A.

Pulkovo Observatory, Leningrad

KOZYREV, N.

Filatov Institute, Laboratory of the Physiology of Vision, Odessa

SHEVALEV, A.

Geology Department of Moscow State University

OGILVY, A.A.

Kazakh University, Alma-ata

GIBADULIN, F.
GRISHCHINKO, V.
INYUSHIN, V.
SHOUISKI, N.
VOROBEV, N.

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July 1972

Institute of Clinical Physiology, Kiev

PODSHIBYAKIN, A.

PART B - Affiliation Unknown (1972)

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ARLASHIN, A.G. (telepathic tests vs distance)
BOGATYREV. V.A.
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FIDLEMAN, V.Ye.
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PART B - Affiliation Unknown

GENKIN, A.A.
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ENGELGARDT, V.A. (Head)
SEVERIN (fnu) (son of Severin, S.Ye.)

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LIGHTS AND COLOR AS A MEANS OF ALTERING HUMAN BEHAVIOR

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SENSORY DEPRIVATION (non-aerospace)

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July 1972

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MERIAKRI, V.V.

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APPENDIX III

FUTURE TRENDS

1. (U) It is now apparent that the ideological stigmas attached to parapsychological phenomena have been breached in the Soviet Union. Although serious studies of psi have been going on in the USSR since the 1920s, it has only been since 1962 that researchers such as L. Vasilev have been allowed to publish their work. In 1971, however, the open literature and the open exchange of ideas between the USSR and the West halted. During the next fifteen years it is expected that the Soviets will energetically pursue all aspects of parapsychology. With party approval and with the large sums of money allocated in the late 1960s, it is inconceivable that the work has stopped. It is believed that certain military applications have been discovered and that by 1980, the Soviets will have mastered some aspects of psi phenomena in order to alter human behavior.

2. (U) The Soviets are concentrating on the development of psycho-warfare agents. One of the more recent areas appear to lie in the development or isolation of marine toxins. The Serbsky Institute of Forensic Psychiatry in Moscow is one such facility shown to have interest in psychotropic substances to include LSD, tranquilizers, and marine toxins. It is believed that the search for new "mindbending" agents will continue in the USSR. Close scrutiny of the literature, etc., especially in marine toxin research is imperative.

3. (U) Based on exhaustive searches of Soviet literature, it is now apparent that the USSR has initiated research into the behavior of insects and animals (possibly human) that is related to pheromones. The technological base is available in the USSR (and elsewhere) which could allow immediate behavioral exploitation of certain insect and animal populations. The use of certain pheromones that cause a gathering of animals to a certain location and release of their aggressive behavior would cause immediate disruption and confusion, and depending on the insect or animal, even death to military units at the focal points of infestation. It is extremely likely that given five to ten years of further research, the Soviets will have the means as well as countermeasures for the military employment of pheromones.

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4. (U) The Soviets, it appears, have already experimented with the use of flashing lights and colored lights for the purpose of eliciting behavioral change in human targets. There is literature available that reports on Soviet work involved in the interactions of sound, light, and olfactory stimuli in humans. The possibility already exists that the USSR has systems for the use of flickering lights in the field. It can now be assessed that in the next 15 years, they may develop a system that alters behavior by combining two or more systems e.g. sound and light together, to mask the use of the principal weapon e.g. the administration of a pheromone or a psychotropic compound.

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APPENDIX IV

THE "1961 DIRECTIVES" (U)

Directives on the Immediate Hospitalization of Persons Mentally Ill Who are a Social Danger, Practice of Forensic Psychiatric Diagnosis, Research Handbook No. 6, under the editorship of G.V. Morozov, Ministry of Health of the USSR, Serbsky Central Research Institute of Forensic Psychiatry of the USSR, Moscow, 1962.

Confirmed by the deputy minister of health of the USSR, I Kochergin, October 10, 1961. Number 04-14 32.

Affirmed for Procurator of the USSR, by Deputy General Procurator of the USSR, A. Mishutin, October 10, 1961.

Affirmed for the Ministry of Internal Affairs of the RSFSR, by the Deputy Minister of Internal Affairs of the RSFSR, P. Romashkov, October 9, 1961.

In a number of instances the necessity for prevention of dangerous actions of persons mentally ill requires their immediate hospitalization in psychiatric institutions. In accordance with this:

1. If there is a clear danger from a person mentally ill to those around him or to himself the health organs have the right (by way of immediate psychiatric assistance) to place him in a psychiatric hospital without the consent of the person who is ill or his relatives or guardians.

2. In the psychiatric institution within 24 hours the sick person hospitalized must be examined by a special committee composed of three doctor-psychiatrists, which considers the question of correctness of hospitalization and determines the necessity for further presence in the hospital. The closest relatives are informed of the hospitalization of the sick person.

3. The basic indication for obligatory hospitalization is the social danger of the sick person as conditioned by the following particular features of his sick condition:

a. Psychomotor excitation with a tendency towards aggressive actions;

b. Deviant conduct accompanied by psychiatric disorder (hallucinations, deliriums, a syndrome of mental automatism,

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syndromes of disordered consciousness, and pathological impulsiveness), if it occurs in a condition of sharply expressed affective tension and a tendency to pass into action;

c. Systematic delirious syndromes with a chronic deteriorating course, if they determine the socially dangerous conduct of the sick person;

d. Hypochondriac delirious conditions causing incorrect, aggressive attitudes of the sick person towards particular persons, organizations and institutions.

The morbid conditions enumerated above, tending within themselves to undoubted social danger, may occur with externally correct conduct and dissimulation. In this connection special care must be used when assessing the mental condition of such persons, so that the indications for immediate hospitalization are not stretched to fit the case, and, at the same time, the possibility of socially dangerous behavior on the part of the mentally sick can be prevented by means of timely hospitalization. The indications for immediate hospitalization enumerated above are not exhaustive, but are only a list of the more frequently occurring illnesses which present a social danger.

4. Simple, although acute, alcoholic intoxication is not an indication for immediate hospitalization in a mental institution, as is not also intoxication brought about by other narcotic compounds (except serious intoxicational psychosis and psychotic variations of abstential conditions), and affective reactions of persons who are not suffering from mental illness.

5. Doctor-psychiatrists effect the immediate hospitalization directly, but in districts where there are no psychiatric institutions doctors belonging to the general medical service do so, as the ill person must be immediately conveyed to the nearest psychiatric hospital.

6. When immediate hospitalization is indicated, the doctor committing the sick person to the hospital is under obligation to give full details of the medical and social grounds for his decision, and in the conclusion of his report on the case, to mention his place of work, the post he occupies, his name, and the time when the decision on immediate hospitalization had been reached.

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7. Local organs of the police in cases of necessity (if relatives or guardians of the ill person object or offer resistance) are obliged to offer assistance to medical workers in the hospitalization of persons mentally ill upon the request of the persons mentioned in paragraph five of the present Directives.

8. Sick persons hospitalized in psychiatric institutions are placed in the department appropriate to their mental condition for carrying out actual treatment, and are subject without exception (no less than once a month) to examination by a special commission composed of three doctor-psychiatrists for consideration of the question of further stay in the hospital. Upon improvement of the mental condition of the sick person, or such changes in the clinical picture of the illness as to eliminate the social danger on the part of the sick person, the commission of doctors issues an opinion on the possible release of the sick person. Release of such an ill person is carred out by handing him over to relatives or guardians.

9. If a sick person who is due, according to medical indications to be released from the hospital, is in a condition where he may not be left on his own and does not have a permanent place of residence or persons able to take care of him, he may be released from the hospital only through transfer to patronage. In cases of necessity the hospital takes measures for the official registration of guardianship over the sick person.

10. Upon release of the sick person the psychiatric hospital informs the relatives of the sick person and the psychoneurological clinician as to where such sick persons must attend for particular check-ups, if they are subject to regular prophylactic treatment.

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APPENDIX V

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The science of mass manipulation plays a major role in modern warfare - at least theoretically. In past wars, a hostile confrontation between two parties was a diplomatic duel, or a military battle which was based on and regulated, in general, by classical concepts of acceptable military conduct (e.g., international agreements on the status of POWs, unarmed civilians, etc.). But this concept has changed. In modern warfare, there is a powerful third force which has, perhaps, the most decisive bearing on the outcome of any diplomatic and/or military confrontation today. This third force is the manipulated mass - individuals who, by modern mass communications media, have been welded into a solid front, holding the same, or very similar, opinions. This third force conflicts with, and ultimately controls the hostile confrontation by appling its criteria rather than the older criteria

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of acceptable diplomatic and military conduct. The study of these criteria is also the task of opinionology. Source again cited, as a case in point, the war in Vietnam. According to older, classical concepts of warfare, the Vietnamese (including the North Vietnamese), should have sided with the Americans who are fighting in Vietnam to liberate the Vietnamese from the threat of Communist oppression and mass terror. Instead, the Vietnamese masses have been welded opinionologically (i.e., deceived by Communist manipulation), into believing that they are fighting for their freedom and national independence against a "foreign (American) invader, whereas in reality they are fighting the Americans to be eventually enslaved by the Communists. Source believes that this situation is an obvious result of American ignorance in manipulating mass media. By ignoring mass opinion (both American and world), the Americans have maneuvered themselves into the position of an "invading foreign power," in the eyes of the opinionologically indoctrinated Vietnamese.

2. General

The study of the pattern of mass manipulation and mass resonance is based on the new scientific approach to psychology known as structural psychology. This psychology, which is also taught in the West, rejects the classical psychology which devotes itself exclusively to the individual. According to structural psychology, the individual is conceived as a derivative of the hierarchic groups which condition and mold his existence. These groups are:

The Intimate micro-group (family);

The social micro-group (environment);

The social molding group (LORENZ, Praegungsgruppe); and

The basic structuring group (ethnic group).

According to structural psychology, the phenomenology of the individual is considered to be a reflection of the phenomenology of these four groups. The study of mass resonance is concerned with the fourth group. Of the different methods of investigating the pattern of this group, opinionology is one of the most rewarding and most commonly used.

a. Glossary of Terms

Source furnished the following glossary to define the psychological and psychiatric terminology used in this report:

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(1) Opinionology: This term is understood as the theory dealing with the unstructured reaction of the masses, and/or the reaction of the unstructured masses. NOTE: Opinionology is not identical with cemoscopy; i.e., PO (public opinion) research which represents statistical evaluations of social data (mainly pseudo data).

(2) Unstructured mass: An unstructured mass consists of large numbers of individuals whose standards of value have been disturbed to a point approaching disintegration, so that the values have become ambiguous as a result. In other words, the reactions governing individuals are not homogeneous to the mass and, therefore, cannot weld the mass into an integrated whole.

(3) Structured mass: A structured mass is one in which certain affective behavior manifestations are constant based on certain laws governing the individuals comprising the mass.

(4) Mental structure of an individual: The mental structure of an individual is composed of certain affective behavior manifestations which remain constant; hence the mental structure of the individual is a repetitive phenomenology.

(5) Structuralization: This is the process of persuading individuals comprising a mass to accept a certain system of values (i.e., a "structure").

(6) Unstructuration: This term has the same definition as item (2) above (unstructured mass).

(7) Structuration: Defined under item (3) above (structured mass). This term can also be defined as the structural form of a mass; i.e., of the individuals comprising the mass.

(8) De-structuration: This is the process of depriving a mass of individuals (structured or structurized), of its values (i.e., its structure).

(9) Engrammation: A permanent effect produced in the psyche as a result of stimulation. It serves as the basis for memory.

(10) Chronaxia: The mimimum time necessary to excite.

(11) Cybernetics: A science dealing with the comparative study of complex electronic calculating machines and the human nervous system in an attempt to explain the nature of the brain.

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(1) The factors of mass de-structuration and of unstructuration; that is, the circumstances under which groups of individuals (masses), become unorientated (not disorientated) masses. Studies show that these masses can be manipulated 100 percent, as a result of de-structuration.

(2) The factors governing the unstructured mass resonance; i.e., public opinion (PO); the excitement threshold of public opinion, its latency period and, as a link between the two, its chronaxia (latency period of the double excitement threshold). See Figure 1.

(3) The types of unstructured mass resonance (public opinion), which range from latent undemonstrated sympathy and/or antipathy, to extreme turbulence and, in the final degree, to massive demonstrations of violence.

(4) The short-term and long-term memory of public opinion (PO), in relation to events, and its engrammation.

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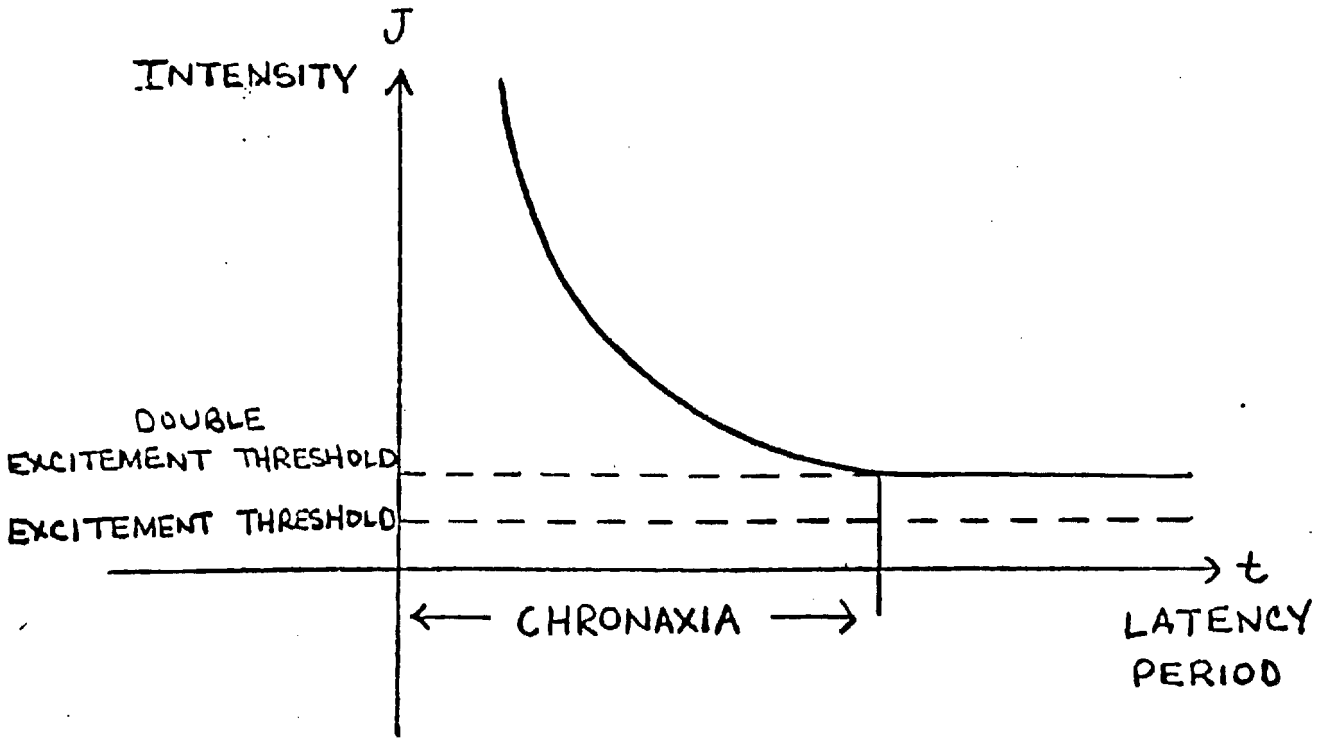

Figure 1 (C) Chart of Public Opinion Resonance

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APPENDIX VI

MILAN RYZL
Biocummunications (Parapsychology) Scientist

1. (U) Doctor Milan Ryzl is an international authority on parapsychology, who has lectured widely both in the United States and in Europe. Doctor Ryzl, educated in Czechoslovakia, was a member of the Czechoslovak Academy of Sciences in Prague and was a leading figure in the application of scientific methods to the study of parapsychology. After he arrived in the United States, he worked with Doctor J.B. Rhine at the Institute of Parapsychology in Durham, North Carolina. There Doctor Ryzl was especially noted for his original research on the influence of hypnosis on ESP.

2. (U) Doctor Ryzl has taught parapsychology at San Diego State College and is currently a professor of parapsychology at San Jose State University. He is a member of and has founded parapsychological and psychical research groups in Europe and in the United States. Doctor Ryzl's primary efforts in this field have been to document a case for parapsychology by means of highly refined and systematized scientific methods. He published his results in, Parapsychology: A Scientific Approach (Hawthorn Books, 1970). In his work, Doctor Ryzl presents indisputable and thoroughly documented evidence that psychic phenomena exist and scientifically examines the full range of psychic phenomena by evaluating experimental evidence derived from laboratory controlled testing.

3. (U) Doctor Ryzl is also well-known as a reviewer and analyst of parapsychology developments and trends in Eastern Europe. He has frequently published reviews and commentaries on parapsychological works from behind the Iron Curtain. One such is Telepatie A Jasnovidnost (Telepathy and Clairvoyance), by Doctor Z. Rejdak. Doctor Ryzl's review of this book was published in the July-August 1971 edition of the Parapsychology Review.

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13. ABSTRACT

(U) Controlled offensive behavior as defined within the scope of this report includes Soviet research on human vulnerability as it applies to methods of influencing or altering human behavior. Emphasis in this report is placed on influencing individuals as opposed to groups. The use of parapsychological phenomena, light, color, sound, pheromones, and biochemicals are included and discussed as it is applicable to altering human behavior.

(U) This report is a trend study and, therefore, contains statements predicting Soviet knowledge and capabilities for influencing human behavior for the period up to + 15 years.

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Astral Projection						
Biocommunication						
Biogenic Amine						
Electromagnetic Effect						
ESP						
Human						
Hypnopedia						
Hypnosis						
Light Perception						
Mind Manipulation						
Odor						
Offensive Behavior						
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